Sun SPARC Enterprise® T5120 and T5220 Servers Installation Guide

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Preface

This installation guide provides instructions and information to help you install Sun SPARC Enterprise T5120 and T5220 servers. The installation instructions assume that you are a system administrator experienced with the Solaris Operating System.

UNIX Commands

This document might not contain information on basic UNIX commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

- Software documentation that you received with your system
- Solaris Operating System documentation, which is at

  (http://docs.sun.com)

Shell Prompts

Shell	Prompt
C shell	*machine-name*%
C shell superuser	*machine-name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Related Documentation

The documents listed as online are available at:

(http://docs.sun.com/app/docs/prod/sparc.t5120)

(http://docs.sun.com/app/docs/prod/sparc.t5220)

Application	Title	Part Number	Format	Location
Product Notes	*Sun SPARC Enterprise T5120 and T5220 Servers Product Notes*	820-2176	PDF	Online
Getting Started	*Sun SPARC Enterprise T5120 Server Getting Started Guide*	820-4417	Printed	Ships with system
Getting Started	*Sun SPARC Enterprise T5120 Server Getting Started Guide (DC)*	820-5838	Printed	Ships with system
Overview	*Sun SPARC Enterprise T5120 and T5220 Servers Overview Guide*	820-2183	PDF HTML	Online
Planning	*Sun SPARC Enterprise T5120 and T5220 Servers Site Planning Guide*	820-2177	PDF HTML	Online
Installation	*Sun SPARC Enterprise T5120 and T5220 Servers Installation Guide*	820-2178	PDF HTML	Online
Administration	*Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide*	820-2179	PDF HTML	Online
Service	*Sun SPARC Enterprise T5120 and T5220 Servers Service Manual*	820-2181	PDF HTML	Online
Safety	*Sun SPARC Enterprise T5120 and T5220 Servers Safety and Compliance Manual*	820-2182	PDF	Online
Remote Management	*Sun Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun SPARC Enterprise T5120 and T5220 Servers*	820-6683	PDF HTML	Online

Documentation, Support, and Training

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Sun SPARC Enterprise T5120 and T5220 Servers Installation Guide, part number 820-2178-12.

Preparing for Installation

This chapter provides background information about the installation procedures for both servers. This chapter contains these topics:

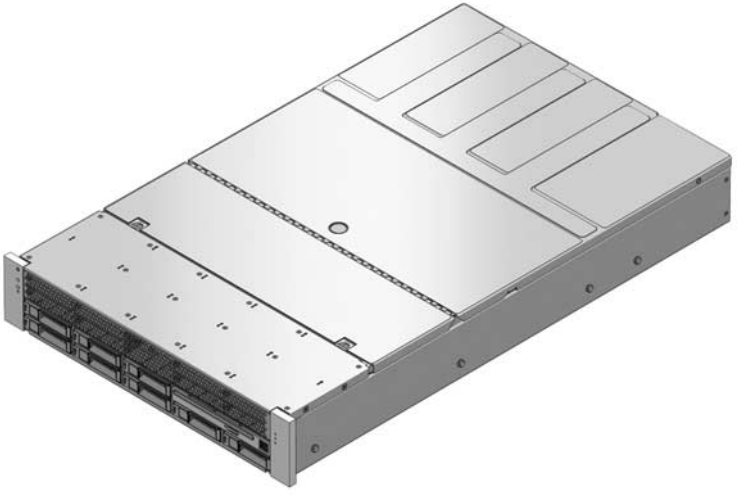
- "Server Handling Precautions" on page 3
- "Input Power Information and Precautions" on page 3
- "Tools and Equipment Needed" on page 4
- "Optional Component Installation" on page 5
- "ESD Precautions" on page 6
- "Installation Overview" on page 6
- "Preparing for Installation" on page 8
- "Installing the Hardware" on page 8
- "Configuring the Service Processor" on page 9
- "Configuring the Host Software" on page 10
- "Cabling Notes for Both Servers" on page 10
- "Port, Connector, and LED Locations for Both Servers" on page 12
- "Slide Rail Assembly Notes for Both Servers" on page 15
- "Cable Management Notes for Both Servers" on page 18

Server Overview

The SPARC Enterprise T5120 server is a 1 rack unit (1U) server. The SPARC Enterprise T5220 server is a 2 rack unit (2U) server.

FIGURE: SPARC Enterprise T5120 Server

FIGURE: SPARC Enterprise T5220 Server



Related Information

- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Getting Started Guide*
- *Sun SPARC Enterprise T5120 and T5220 Servers Getting Started Guide (DC)*

Server Handling Precautions

Caution – Deploy the antitilt bar on the equipment rack before beginning an installation.

Caution – The SPARC Enterprise T5220 server weighs approximately 55 lb (25. kg). Two people are required to lift and mount this 2U server into a rack enclosure when using the procedures in this document.

Caution – When completing a two-person procedure, always communicate your intentions clearly before, during, and after each step to minimize confusion.

Related Information

- "Input Power Information and Precautions" on page 3
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Getting Started Guide*
- *Sun SPARC Enterprise T5120 and T5220 Servers Getting Started Guide (DC)*

Input Power Information and Precautions

The Sun SPARC Enterprise T5120 and T5220 servers are available in the following input power configurations:

- Two redundant, hot-swappable AC power supplies

- Two redundant, DC power supplies

Note – Safety agency requirements prohibit manufacturers from changing a product from AC input to DC input or from DC input to AC input after the product has been removed from the agency approved manufacturing site.

Note – The DC version of the server must be installed in a restricted-access location. According to the intent of the National Electrical Code, a restricted-access location is an area intended for qualified or trained personnel only and has access controlled by a locking mechanism, such as a key lock or an access card system.

When each power supply is connected to a separate power source, the server continues to operating under the following fault conditions:

- A power source failure that removes input power from one of the power supplies.
- Failure of one of the power supplies.
- Service actions which require removal of one of the power supplies.

Refer to the *Sun SPARC Enterprise T5120 and T5220 Servers Site Planning Guide* for input power specifications.

Note – Input AC/DC power cables: To avoid missing initialization messages, do not attach power cables to the power supplies until you have finished connecting the data cables, and have connected the server to a serial terminal or a terminal emulator (PC or workstation). The server goes into Standby mode and the ILOM service processor initializes as soon as the input power cables are connected to the power source.

Related Information

- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Site Planning Guide*

Tools and Equipment Needed

To install the system, you must have the following tools:

- No. 2 Phillips screwdriver
- ESD mat and grounding strap

In addition, you must provide a system console device, such as one of the following:

- ASCII terminal
- Workstation
- Terminal server
- Patch panel connected to a terminal server

Related Information

- "Optional Component Installation" on page 5

Optional Component Installation

The standard components of the server are installed at the factory. However, if you ordered options such as additional memory or PCI cards, these options will be shipped separately. If possible, install these components prior to installing the server in a rack.

If you ordered any options that are not factory-installed, see the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for installation instructions.

Note – The list of optional components can be updated without notice. See the product web pages for the most current list of components supported in the server.

Related Information

- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Getting Started Guide*
- *Sun SPARC Enterprise T5120 and T5220 Servers Getting Started Guide (DC)*
- *Sun SPARC Enterprise T5120 and T5220 Servers Service Manual*

ESD Precautions

Electronic equipment is susceptible to damage by static electricity. Use a grounded antistatic wriststrap, footstrap, or equivalent safety equipment to prevent electrostatic damage (ESD) when you install or service the servers.

Caution – To protect electronic components from electrostatic damage, which can permanently disable the system or require repair by service technicians, place components on an antistatic surface, such as an antistatic discharge mat, an antistatic bag, or a disposable antistatic mat. Wear an antistatic grounding strap connected to a metal surface on the chassis when you work on system components.

Related Information

- "Installation Overview" on page 6

Installation Overview

This installation guide provides procedures that are to be performed in the following order.

FIGURE: Installation Overview

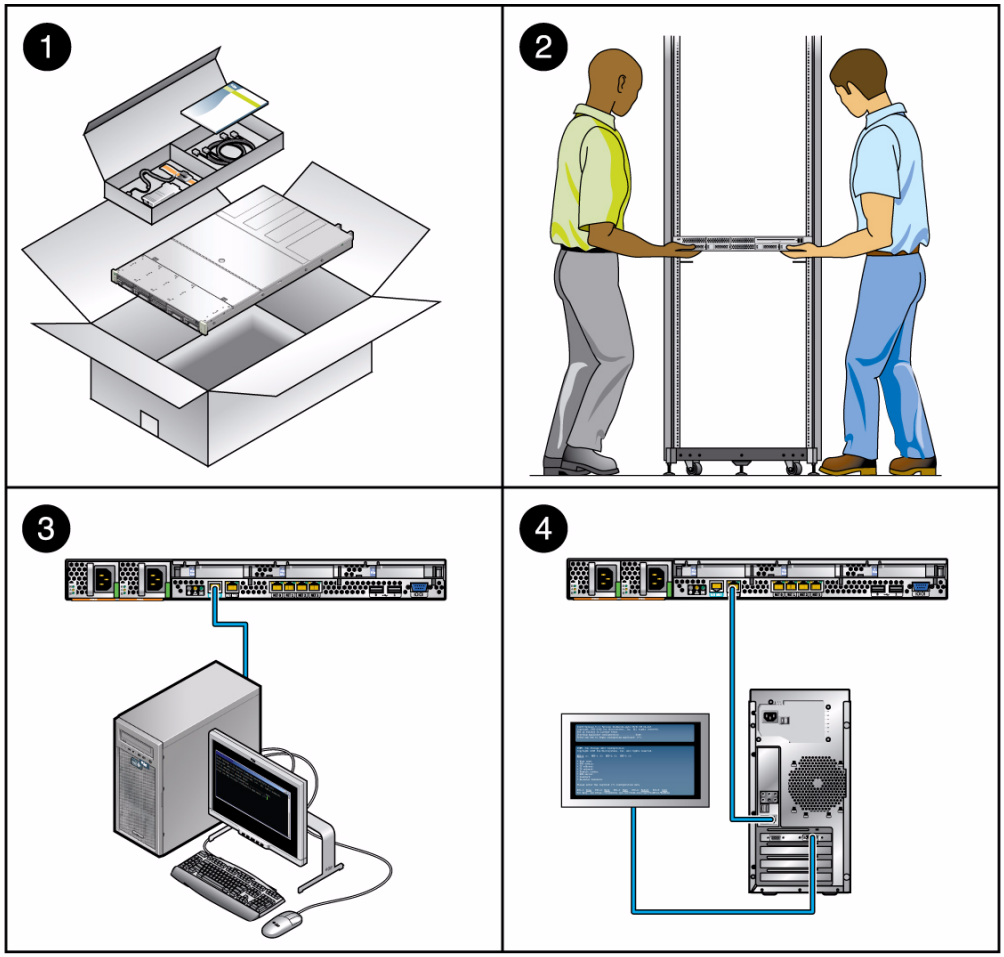


Figure Legend

1	Preparing for installation
2	Installing the hardware
3	Configuring the service processor
4	Configuring the host software

Preparing for Installation

1. Verify that you have received all of the components that ship with your server.
2. Gather configuration information for your system. See your system administrator for specific details, including these parameters:
   - Netmask
   - IP address for the service processor
   - Gateway IP address
3. Install any optional components shipped with your system. If you have purchased other optional components such as additional memory, install them prior to mounting the server in a rack.

Related Information

- "Optional Component Installation" on page 5

Installing the Hardware

1. Mount the server into a rack or cabinet. See "Installing the Servers in a Rack" on page 19 for both the 1U and 2U servers. Or, if you ordered the express rail rackmounting kit, which has the same rack rail assemblies for both servers, see "Installing the Servers in a Rack With Express Rails" on page 76.

Note – In the rest of this manual, the term *rack* means either an open rack or a closed cabinet.

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2. Connect the server to a serial terminal or a terminal emulator (PC or workstation) to display system messages. See "Powering On the System for the First Time" on page 43.

Tip – The serial terminal or a terminal emulator should be connected before you connect the power cables. As soon as AC power is connected to the system, the service processor immediately powers on and runs diagnostics. Diagnostic test failures will be printed on the serial terminal. For more information, refer to the *Integrated Lights Out Manager 2.0 Supplement for SPARC Enterprise T5120 and T5220 Servers*.

3. Connect the data cables to the server, but do not connect the AC power cable yet. See "Connecting the Server Cables for Both Servers" on page 34.
4. Connect the AC power cable to the server and examine the display for any error messages. See "Powering On the System for the First Time" on page 43.

Caution – There is a potential for electric shock if the server and related equipment are not properly grounded.

Note – The service processor runs on the 3.3V standby voltage. As soon as AC power is connected to the system, the service processor immediately powers on, runs diagnostics, and initializes the ILOM firmware.

Related Information

- "Configuring the Service Processor" on page 9

Configuring the Service Processor

1. After the service processor boots, access the ILOM command-line interface (CLI) through the serial management port. See "To Log Into the Service Processor Using the Network Management Port" on page 55.
2. Configure the service processor network addresses. See "To Configure the Service Processor Network Management Port" on page 52.

Note – The service processor network management port is not operational until you configure network settings for the service processor (through the service processor serial management port).

3. Commit the changes to the service processor network parameters. See Step 3 in "To Power On the System for the First Time" on page 44.

4. Power on the server from a keyboard using the ILOM software.

Related Information

- "To Power On the System" on page 56

Configuring the Host Software

1. Configure the Solaris OS. See "Booting the Solaris Operating System" on page 61.

   The Solaris OS is preinstalled on the servers. When you power on, you are automatically guided through the Solaris OS configuration procedure.

2. Install any required patches to the server.

   Refer to the *SPARC Enterprise T5120 and T5220 Server Product Notes* for a list of required patches.

3. Load additional software from the Solaris media kit (optional).

   The Solaris media kit (sold separately) includes several CDs containing software to help you operate, configure, and administer your server. Refer to the documentation provided with the media kit for a complete listing of included software and detailed installation instructions.

Related Information

- "Cabling Notes for Both Servers" on page 10
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Product Notes*

Cabling Notes for Both Servers

- Minimum cable connections for the servers:
  - At least one system on-board Ethernet network connection (NET port)
  - The service processor serial management port (SER MGT port)
  - The service processor network management port (NET MGT port)

- Power cables for the two system power supplies

- **Service processor management ports:** There are two service processor management ports for use with the ILOM service processor.
  - **The service processor serial management port** (labeled SER MGT) uses an RJ-45 cable and is always available. This port is the default connection to the ILOM service processor.
  - **The service processor network management port** (labeled NET MGT) is the optional connection to the ILOM service processor. This port is not available until you configure network settings for the service processor (through the service processor serial management port). See "Enabling the Service Processor Network Management Port" on page 49. The service processor network management port uses an RJ-45 cable for a 10/100 BASE-T connection. This port does not support connections to Gigabit networks.

See the *SPARC Enterprise T5120 and T5220 Servers Overview* for more information.

- **Ethernet ports** are labeled NET0, NET1, NET2, and NET3. The Ethernet interfaces operate at 10 Mbps, 100 Mbps, and 1000 Mbps.

TABLE: Ethernet Connection Transfer Rates

Connection Type	IEEE Terminology	Transfer Rate
Ethernet	10BASE-T	10 Mbit/sec
Fast Ethernet	100BASE-TX	100 Mbits/sec
Gigabit Ethernet	1000BASE-T	1000 Mbit/sec

- **TTY serial port:** Use the DB-9 connector with a null modem cable for serial devices. This port appears as `ttya` in Solaris OS and OpenBoot messages. This port is not connected to the service processor serial management port.
- **USB Ports:** USB ports support hot-plugging. You can connect and disconnect USB cables and peripheral devices while the system is running, without affecting system operations.
  - You can only perform USB hot-plug operations while the OS is running. USB hot-plug operations are not supported when the system `ok` prompt is displayed or before the system has completed booting.
  - You can connect up to 126 devices to each of the four USB controllers, for a total of 504 USB devices per system.
- **AC power cables:** Do not attach power cables to the power supplies until you have finished connecting the data cables, and have connected the server to a serial terminal or a terminal emulator (PC or workstation). The server goes into Standby mode and the ILOM service processor initializes as soon as the AC power cables are connected to the power source. System messages might be lost after 60 seconds if the server is not connected to a terminal, PC, or workstation.

Related Information

- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Getting Started Guide*
- *Sun SPARC Enterprise T5120 and T5220 Servers Getting Started Guide (DC)*
- *SPARC Enterprise T5120 and T5220 Servers Overview*

Port, Connector, and LED Locations for Both Servers

The ports on the servers are shown in the figures below.

FIGURE: Rear Panel Cable Connectors and LEDs on the SPARC Enterprise T5120 Server

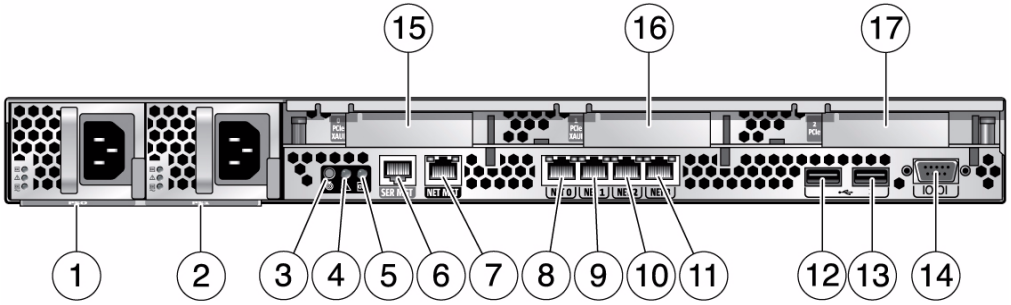


Figure Legend

1	Power supply 0	**10**	Gbit Enet port NET2
2	Power supply 1	**11**	Gbit Enet port NET3
3	Locator LED button	**12**	USB port 0
4	Service Required LED	**13**	USB port 1
5	Power OK LED	**14**	TTYA serial port
6	Service processor serial management port	**15**	PCIe/XAUI slot 0
7	Service processor network management port	**16**	PCIe/XAUI slot 1
8	Gbit Enet port NET0	**17**	PCIe slot 2
9	Gbit Enet port NET1		

USB ports 2 and 3 are located on the front panel.

FIGURE: Front Panel USB Ports on the SPARC Enterprise T5120 Server

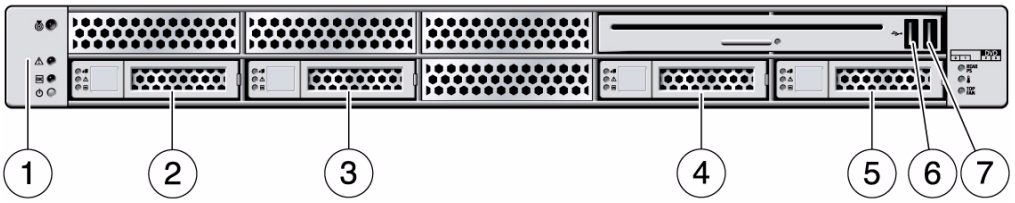


Figure Legend

1	System status indicators: Top to bottom: Locator LED button, Service Required LED, Power OK LED, Power button	**5**	Hard drive HDD3
2	Hard drive HDD0	**6**	USB port 2
3	Hard drive HDD1	**7**	USB port 3
4	Hard drive HDD2		

FIGURE: Rear Panel Cable Connectors and LEDs on the SPARC Enterprise T5220 Server

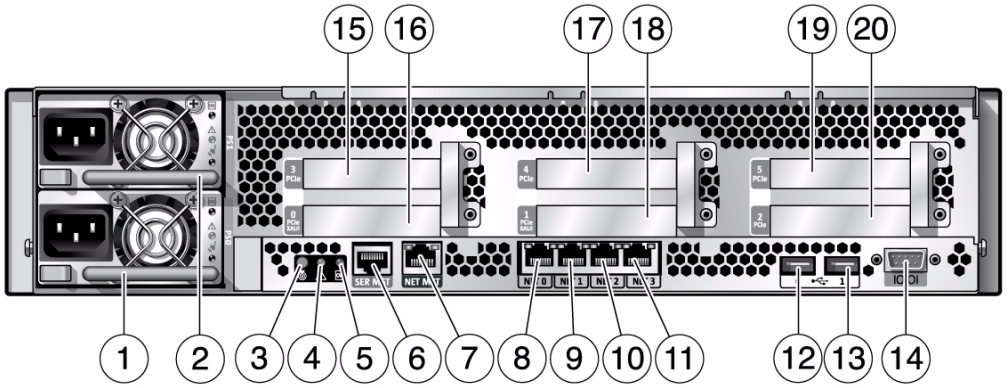


Figure Legend

1	Power supply 0	**11**	Gbit Enet port NET3
2	Power supply 1	**12**	USB port 0
3	Locator LED button	**13**	USB port 1
4	Service Required LED	**14**	TTYA serial port
5	Power OK LED	**15**	PCIe slot 3
6	Service processor serial management port	**16**	PCIe or XAUI slot 0
7	Service processor network management port	**17**	PCIe slot 4

Figure Legend *(Continued)*

8	Gbit Enet port NET0	**18**	PCIe or XAUI slot 1
9	Gbit Enet port NET1	**19**	PCIe slot 5
10	Gbit Enet port NET2	**20**	PCIe slot 2

USB ports 2 and 3 are located on the front panel.

FIGURE: Front Panel USB Ports on the SPARC Enterprise T5220 Server

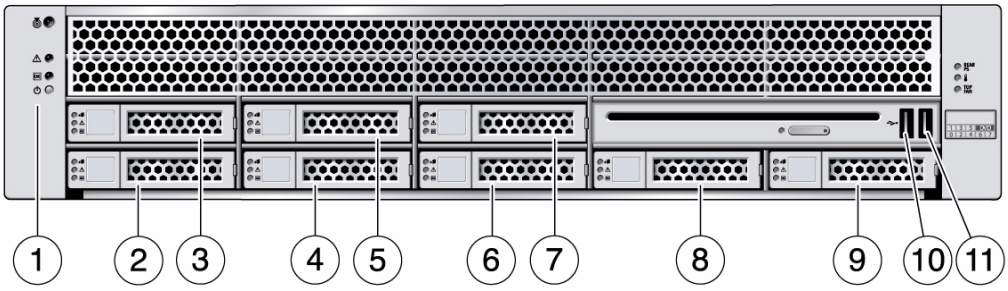


Figure Legend

1	System status indicators: Top to bottom: Locator LED button, Service Required LED, Power OK LED, Power button	**7**	Hard drive HDD5
2	Hard drive HDD0	**8**	Hard drive HDD6
3	Hard drive HDD1	**9**	Hard drive HDD7
4	Hard drive HDD2	**10**	USB port 2
5	Hard drive HDD3	**11**	USB port 3
6	Hard drive HDD4		

Related Information

- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Getting Started Guide*
- *Sun SPARC Enterprise T5120 and T5220 Servers Getting Started Guide (DC)*
- *SPARC Enterprise T5120 and T5220 Servers Service Manual*

Slide Rail Assembly Notes for Both Servers

The rackmounting kit has two *slide rail assemblies*. A slide rail assembly can be installed on either the right or left side of the rack.

Note – The slide rail assemblies are different for the T5120 and T5220 servers. The removable mounting bracket of the SPARC Enterprise T5120 rails slides 13 in. (33 cm) out of the slide rail, then locks in place. The removable mounting bracket of the SPARC Enterprise T5220 rails slide 14 in. (35.5 cm) before locking.

Each slide rail assembly consists of a three-section slide rail and a removable mounting bracket.

FIGURE: Sections of the Slide Rail Assembly on the SPARC Enterprise T5220 Server

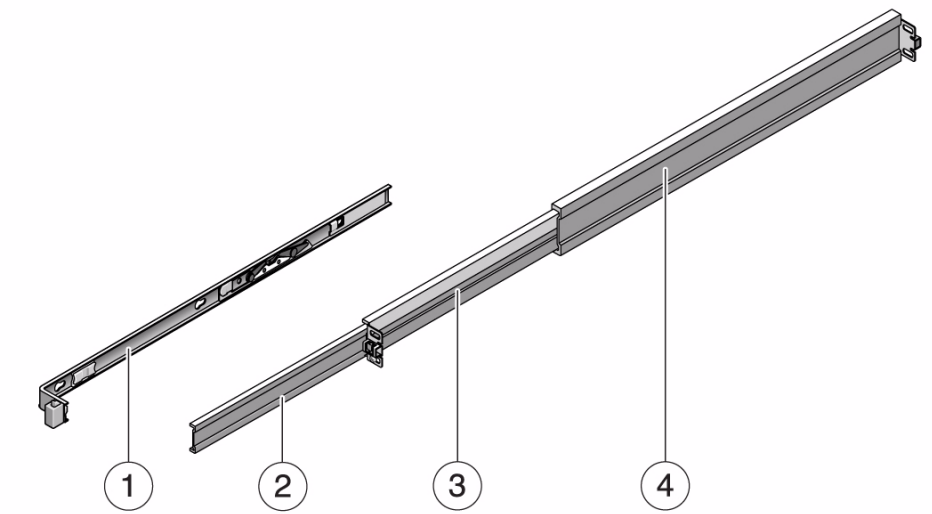
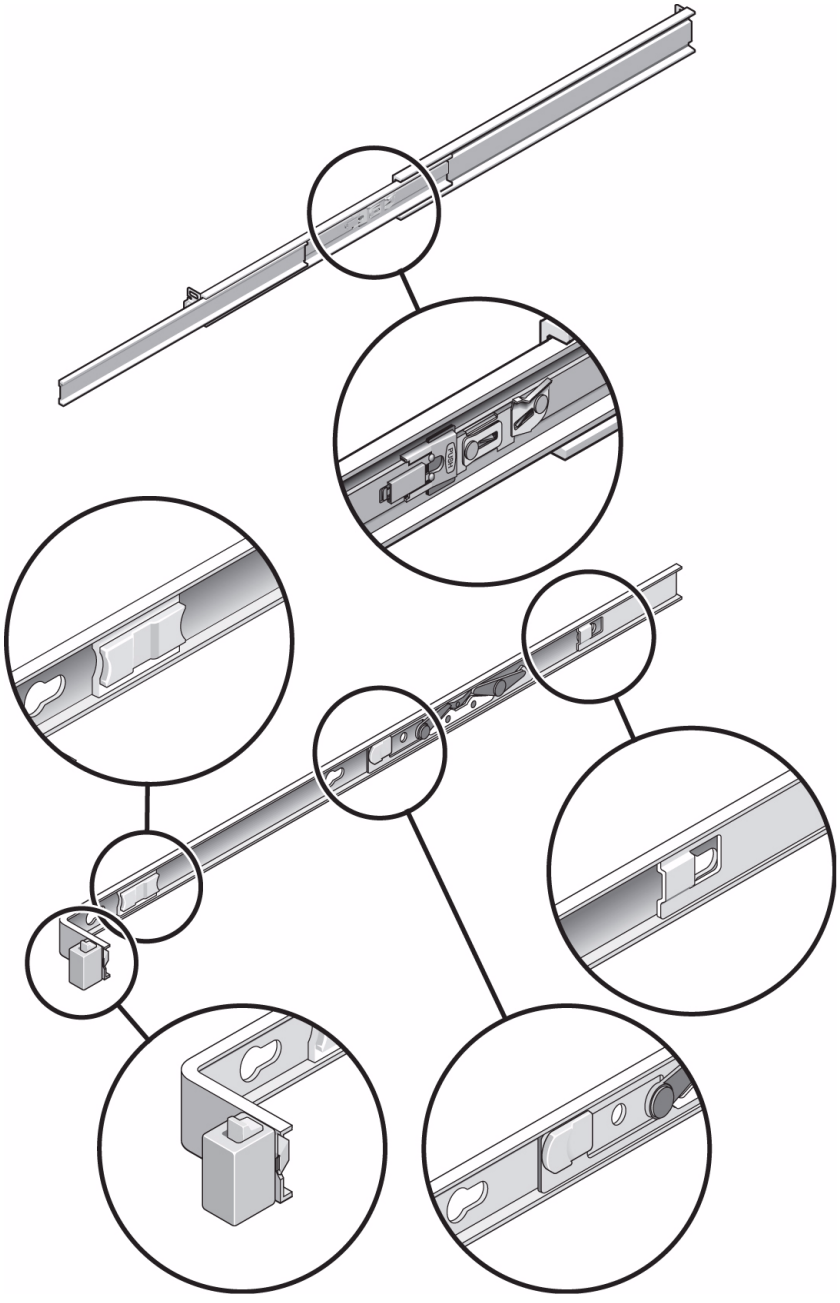


Figure Legend

1	Mounting bracket
2	Front section
3	Middle section
4	Rear section

- The *front*, *middle*, and *rear* sections form the *slide rail*. The middle and rear sections have holes for mounting screws, and adjust to fit rack depths from 24 in. (61 cm) to 36.5 in. (93 cm). The front section can be extended to allow movement of the server out of the rack.
- The removable *mounting bracket* slides 14 in. (35.5 cm) out of the slide rail, then locks in place. If you unlock the mounting bracket at this point, it slides an additional 12 in. (30 cm) before separating from the slide rail. You can then mount the mounting bracket to the right or left side of the server chassis.
- Note that there are five locks in a slide rail assembly. Four are on the mounting bracket. One lock is on the front section of the slide rail. The locks are described in "Installing the SPARC Enterprise T5120 and T5220 Servers" on page 19.

FIGURE: Locating the Locks on the Slide Rail Assembly for the SPARC Enterprise T5220 Server



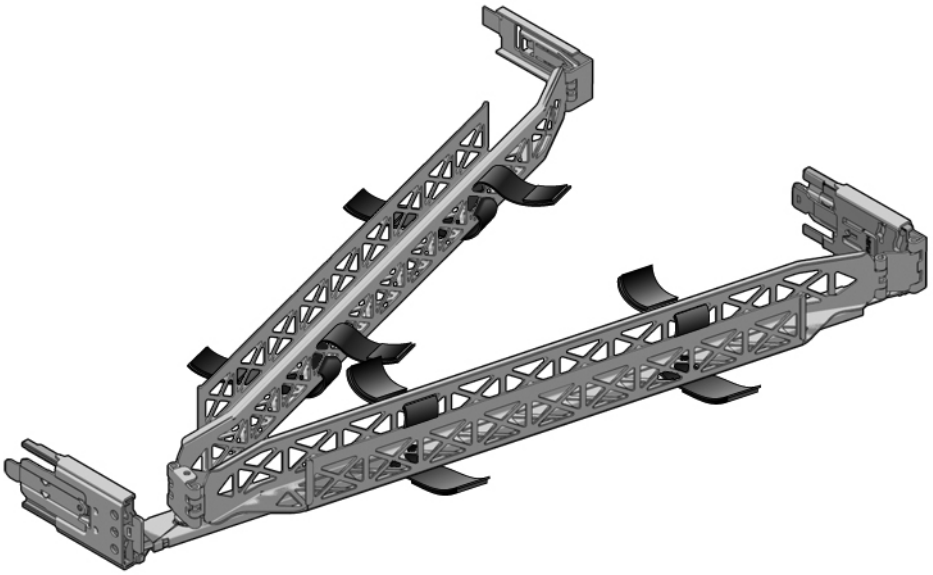
Related Information

- "Cable Management Notes for Both Servers" on page 18
- "Installing the Servers in a Rack" on page 19

Cable Management Notes for Both Servers

The same cable management arm (CMA) is included with the rackmounting kit for each server. The CMA clips onto the slide rails. Use the velcro straps to secure cabling to the CMA.

FIGURE: Cable Management Arm for Both Servers



Installing the SPARC Enterprise T5120 and T5220 Servers

This chapter provides instructions for installing the servers into an equipment rack.

Note – If your rackmounting kit came with its own instructions, use the instructions in your rackmounting kit instead of the instructions in this chapter. After performing the server installation, proceed to "Powering On the System" on page 43 for first-time power on.

This chapter contains the following sections:

- "Installing the Servers in a Rack" on page 19
- "Installing the Cable Management Arm for Both Servers" on page 27
- "Connecting the Server Cables for Both Servers" on page 34
- "Managing Cables With the CMA" on page 39
- "Dismounting the Servers" on page 40

Note – References to left and *right* are from your viewpoint as you face either the front or rear of the equipment.

Installing the Servers in a Rack

Note – Ensure that you have all of the parts in the rackmounting kit before you begin the installation of the server.

Note – The procedures in this chapter are the same for both the 1U and 2U servers. The illustrations show a 2U server only as an example.

The rackmounting kit (same for both 1U and 2U servers) contains two slide rail assemblies, which can be installed on either the right or left side of the rack. A slide rail assembly consists of two parts, a slide rail and a removable mounting bracket. The slide rail attaches to the rack posts. The mounting bracket attaches to the server chassis. See "Slide Rail Assembly Notes for Both Servers" on page 15 for more information about slide rail assemblies.

Related Information

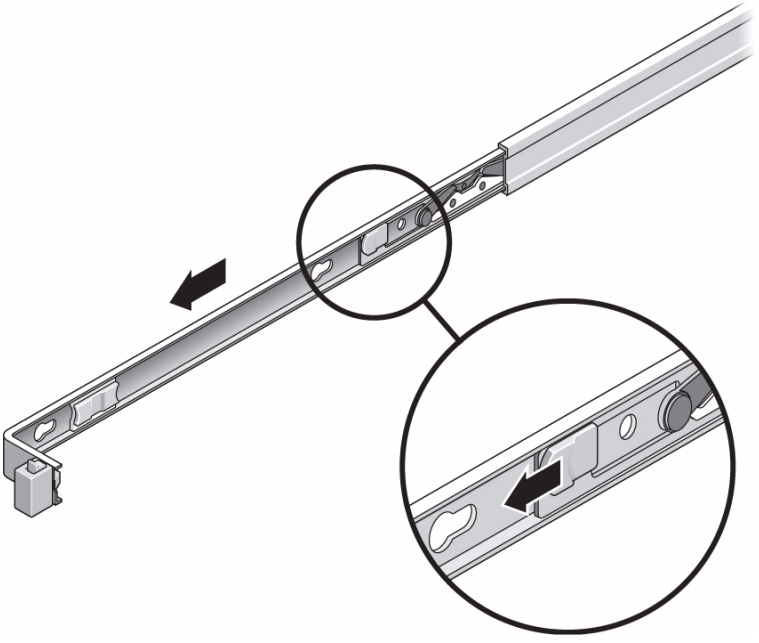
- "Slide Rail Assembly Notes for Both Servers" on page 15
- "To Install the Slide Rail Assemblies" on page 20

▼ To Install the Slide Rail Assemblies

1. **Pull both mounting brackets completely out of their respective slide rails.**

   a. **Simultaneously press and hold the upper and lower lock buttons of the slide rail lock.**

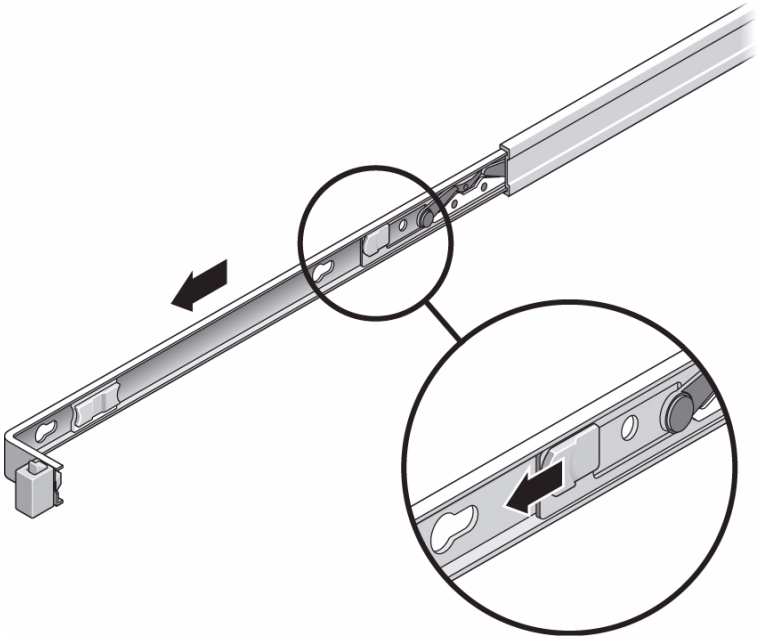
FIGURE: Unlocking the Slide Rail Assembly (Either Server)



   b. **Pull the mounting bracket out until it locks in the extended position.**

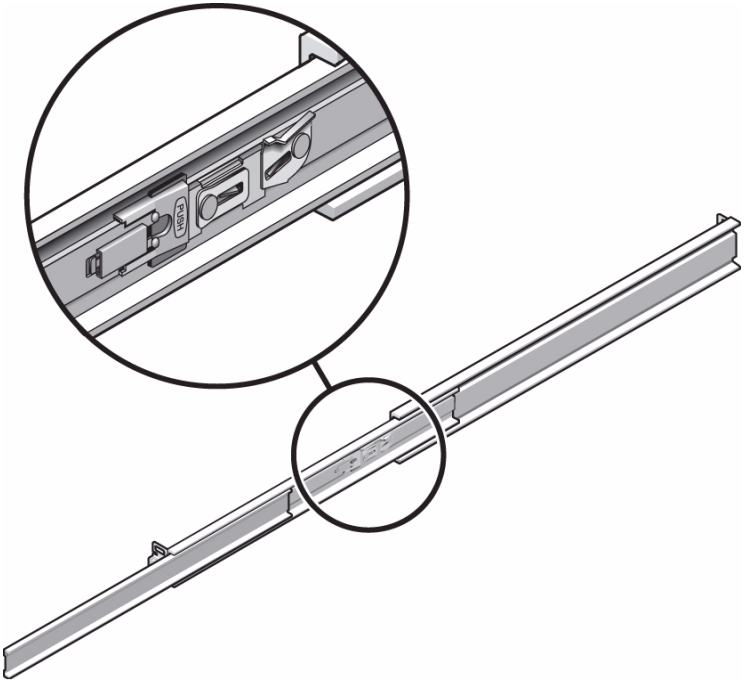
c. Slide the mounting bracket release button out in the direction shown, then slide the mounting bracket out of the slide rail.

FIGURE: Location of the Mounting Bracket Release Button (Either Server)



d. Press the metal lever (labeled Push) on the middle section of the sliding rail, then push the middle section back into the rack.

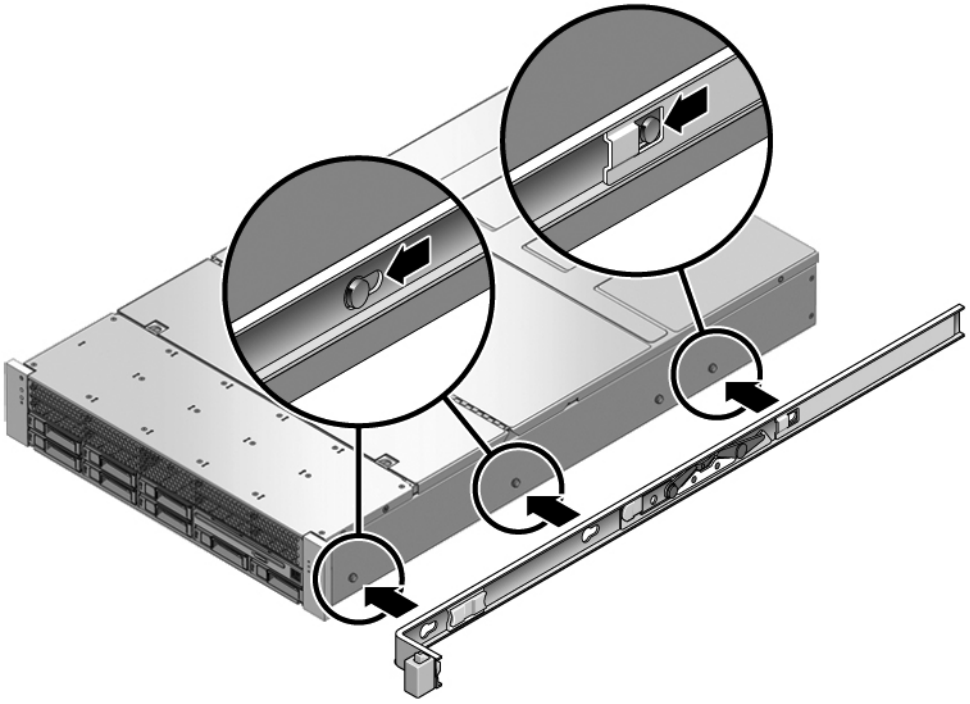
FIGURE 0-1 Unlocking the Slide Rail Middle Section (Either Server)



2. **Attach a mounting bracket to the right side of the chassis.**

   a. **Position the mounting bracket against the chassis. Ensure that the slide rail lock is at the front and the three keyed openings on the mounting bracket are aligned with the three locating pins on the side of the chassis.**

FIGURE: Attaching a Mounting Bracket to the Chassis (Either Server)



b. Ensure that the heads of the locating pins protrude though the keyed openings in the mounting bracket. Pull the mounting bracket toward the front of the chassis until the bracket locks into place with an audible *click*.

c. Verify that all locating pins are trapped in the keyed openings and that the correct locating pin has engaged the mounting bracket lock.

3. **Attach the second mounting bracket to the left side of the chassis.**

4. **Determine which rack hole numbers to use when attaching the slide rails to the rack posts.**

   If the server is two rack units high (2U), the slide rails occupy the lower half of the 2U space.

5. **Determine which screws you will use to mount the slide rails.**

   If your rack has threaded mounting holes in the rack posts, determine whether the threads are metric or standard. Select the appropriate screws from the package included in the mounting kit.

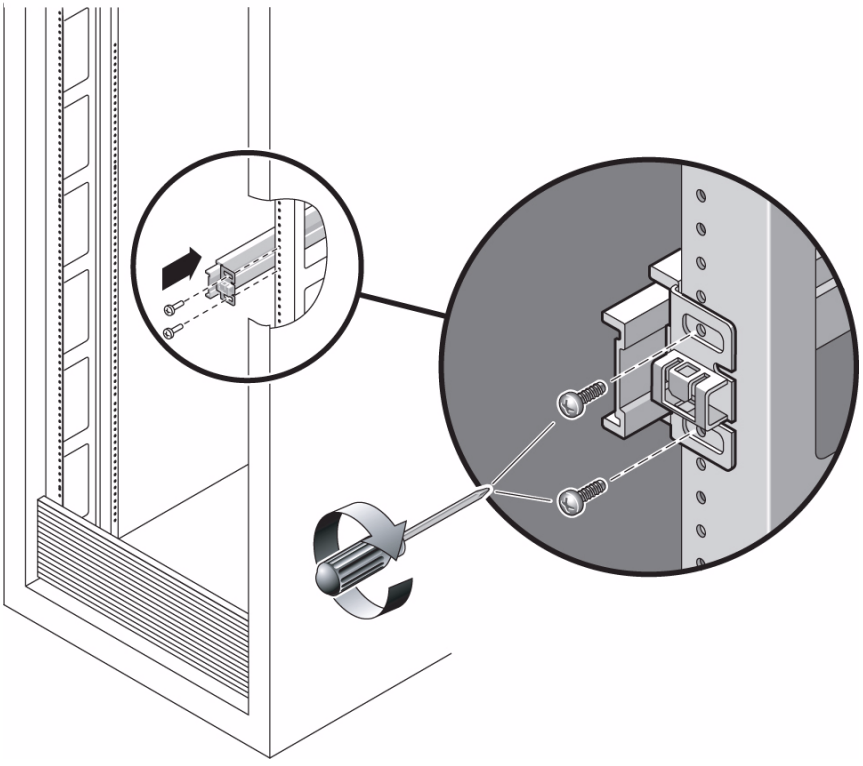
   If your rack does not have threaded mounting holes, the mounting screws are secured with a caged nut.

6. **Attach a slide rail to the right front rack post.**

   a. **Loosely attach the front of a slide rail to the right front rack post using two screws.**

Note – Do not tighten the screws yet.

FIGURE: Mounting a Slide Rail (Either Server)



   b. **Adjust the length of the slide rail by sliding the rear mounting flange to reach the outside edge of the rear rack post.**

   c. **Loosely attach the rear of the slide rail to the rear rack post with two screws.**

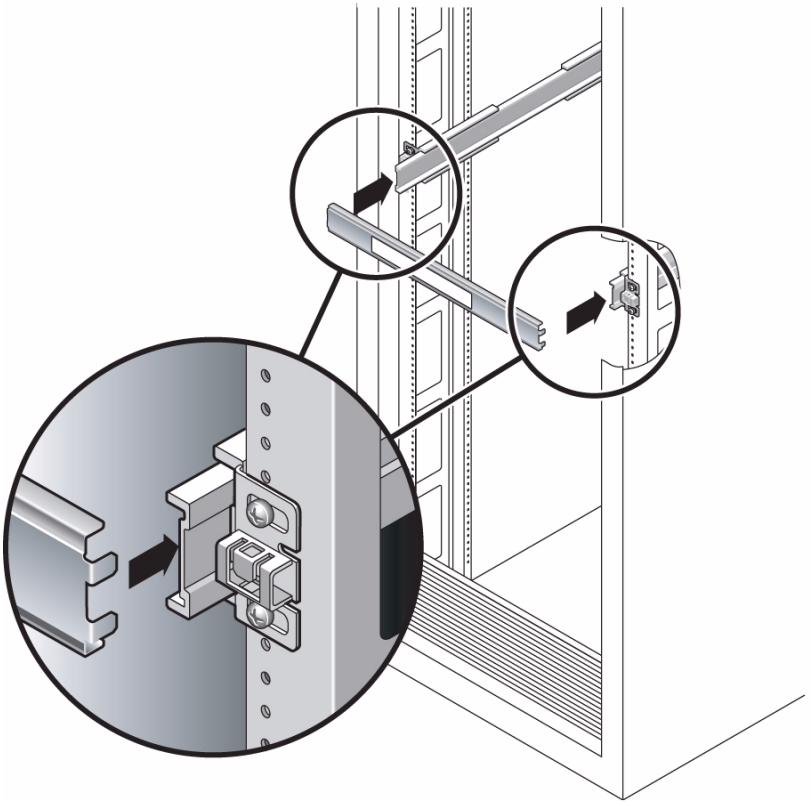
7. **Attach the second slide rail to the left rack posts in a similar manner.**

   Do not tighten the screws.

8. **Use the slide rail spacing tool to adjust the distance between the slide rails.**

   a. **At the front of the rack, plug the left side of the tool into slots at the end of the left rail.**

FIGURE: Using the Slide Rail Spacing Tool to Adjust the Distance Between the Slide Rails (Either Server)



b. Insert the right side of the tool into the front end of the right rail.

c. Slide the end of the rail to the right or left as needed to allow the ends of the tool to enter the ends of both rails.

The distance between the rails is now equal to the width of the server with mounting brackets.

d. Tighten the screws to lock the ends of the rails in place.

e. At the rear of the rack, repeat Step a through Step d for the rear ends of the rails.

Related Information

- "To Insert and Lock the Server in the Rack" on page 26

▼ To Insert and Lock the Server in the Rack

1. Insert the ends of the mounting brackets into the sliding rails.

Caution – The weight of the servers on extended slide rails can be enough to overturn an equipment rack.

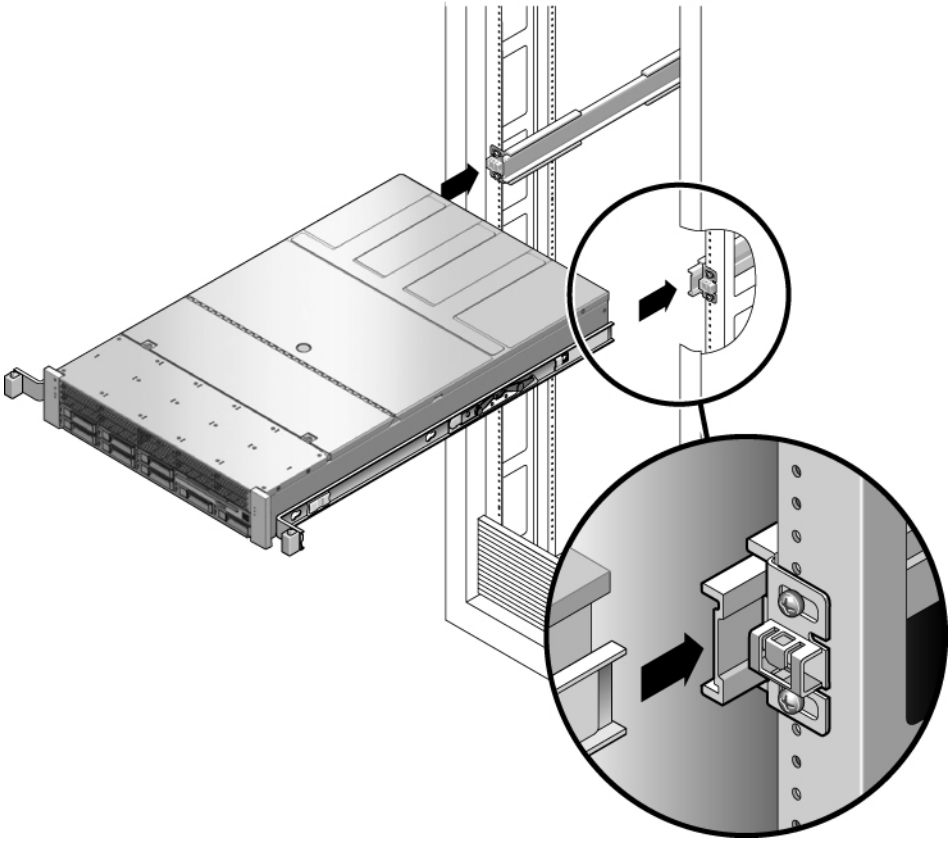
Caution – The 2U server weighs approximately 55 lb (25 kg). Two people are required to lift and mount the server into a rack enclosure when using the procedures in this chapter.

Caution – Before continuing, verify that the server is securely mounted in the rack, and that the slide rails are locked to the mounting brackets.

2. Deploy the antitilt bar, if the chassis or rack has an antilt bar.

3. Slide the chassis into the rack.

FIGURE: Mounting the Chassis on the Slide Rails (Either Server)



Related Information

- "Installing the Cable Management Arm for Both Servers" on page 27

Installing the Cable Management Arm for Both Servers

The rackmounting kit for each server comes with the same cable management arm (CMA) assembly. The CMA installation and cable management procedures are the same for both servers. See "Cable Management Notes for Both Servers" on page 18 for more information on the cable management arm.

Note – The CMA includes velcro straps to secure the cables inside the CMA. Do not install the velcro straps until you install the CMA, connect the cables, and place the cabling inside the CMA as described in the following procedures.

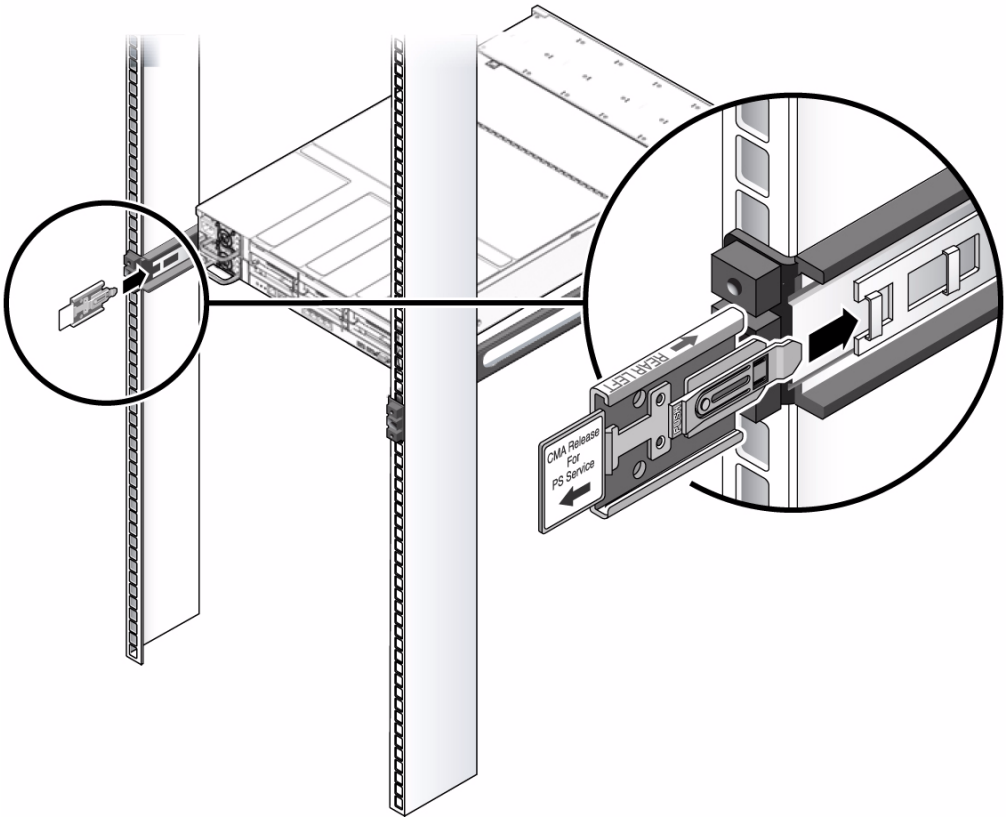
▼ To Install the Cable Management Arm

Caution – Support the CMA during this installation. Do not allow the assembly to hang by its own weight until it is secured by all three attachment points.

1. **Remove the tape from the CMA rail extension (on the left of the CMA) and remove the CMA rail extension.**
2. **Attach the CMA rail extension to rear left slide rail.**

   At the rear of the rack, plug the CMA rail extension into the end of the left sliding rail assembly. The tab at the front of the rail extension clicks into place.

FIGURE: Inserting the CMA Rail Extension Into the Rear of the Left Slide Rail (Either Server)

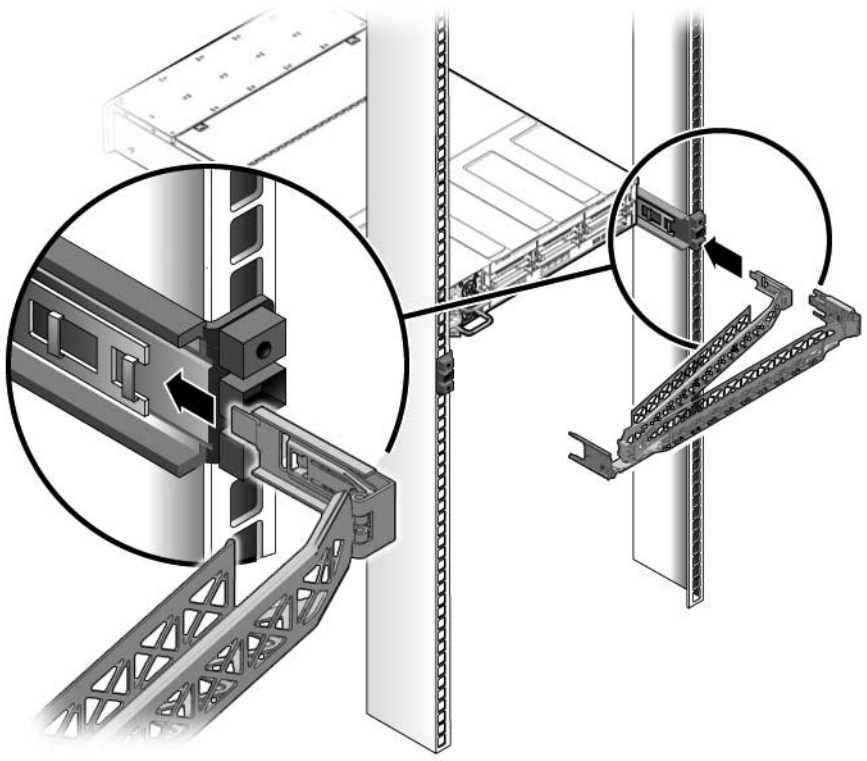


The right sides of the two CMA arms have hinged extensions. On the manufacturer's instruction sheet, the smaller extension is called the CMA Connector for Inner Member. This extension attaches to the right mounting bracket. The larger extension is called the CMA Connector for Outer Member, and attaches to the right sliding rail.

3. **Insert the smaller extension into the clip located at the end of the mounting bracket.**

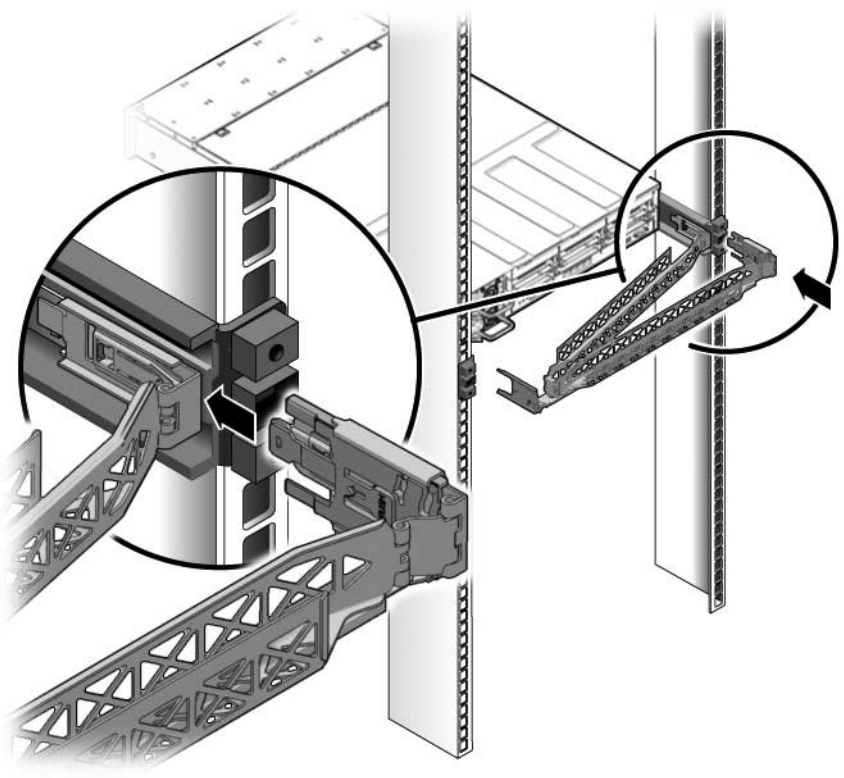
   Slide the smaller extension into the square hole on the middle-in-width of the clip that is located at the end of the mounting bracket.

FIGURE: Mounting the Inner CMA Connector (Either Server)



4. Insert the larger extension into the end of the right sliding rail.

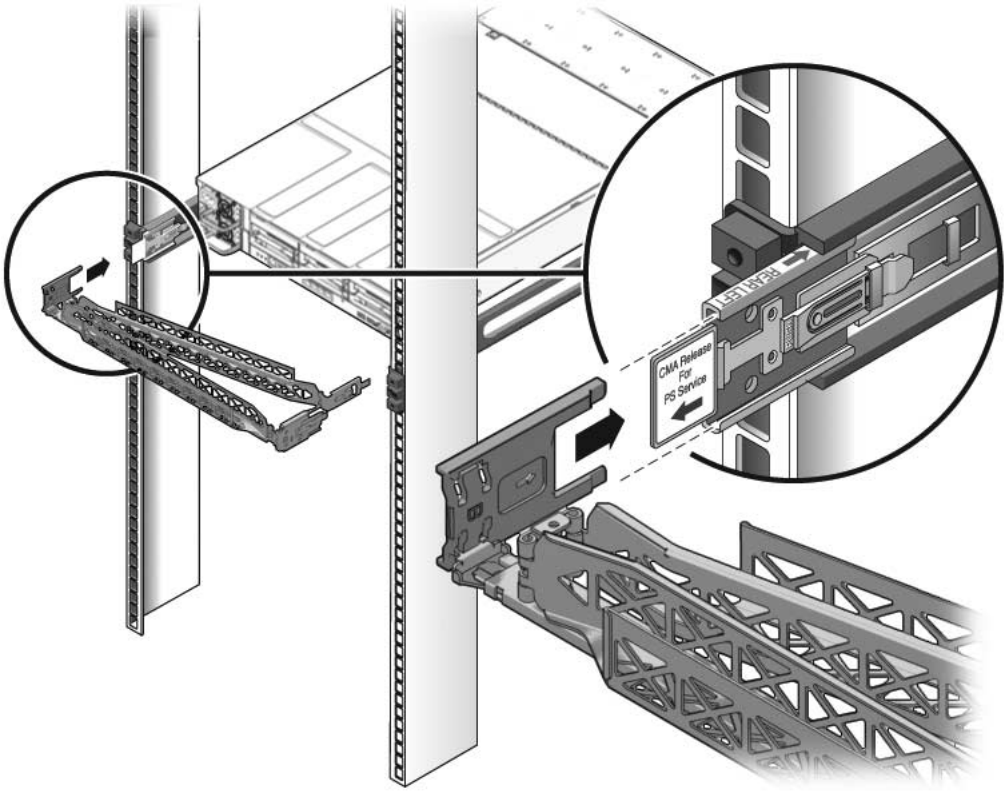
FIGURE: Attaching the Outer CMA Connector (Either Server)



5. **Insert the hinged plastic connector at the left side of the CMA fully into the CMA rail extension.**

   The plastic tab on the CMA rail extension locks the hinged plastic connector in place.

FIGURE: Mounting the Left Side of the Slide Rail (Either Server)



Related Information

- "To Verify the Operation of the Slide Rails and the CMA" on page 32
- "Cable Management Notes for Both Servers" on page 18

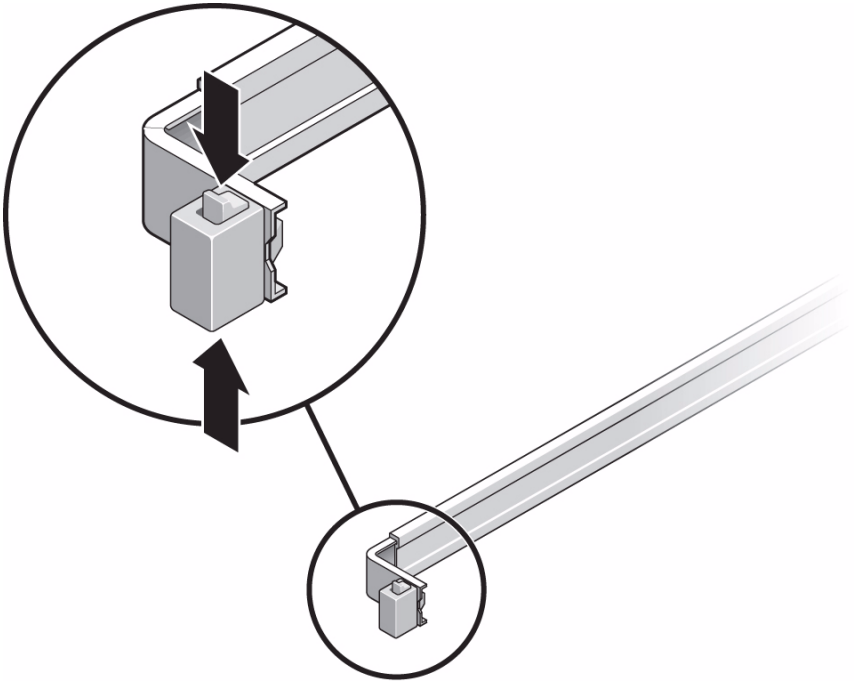
▼ To Verify the Operation of the Slide Rails and the CMA

Tip – Two people are needed for this procedure, one to move the server in and out of the rack, and one to observe the cables and CMA.

1. **For a free-standing rack, deploy the antitilt bar.**

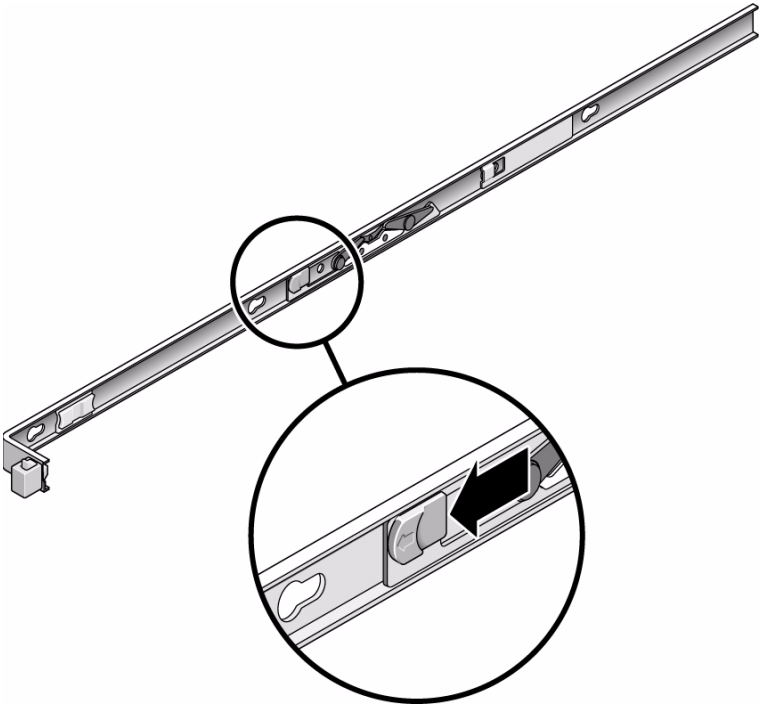
2. **Unlock the slide lock buttons at the right and left sides of the chassis.**
3. **Slowly pull the server out of the rack until the slide rails reach their stops.**

FIGURE: Unlocking the Slide Rail Assembly (Either Server)



4. **Inspect any attached cables for binding or kinks.**
5. **Verify that the CMA extends fully and does not bind in the slide rails.**
6. **Verify that the server extends fully and locks in the maintenance position.**
   The server should stop after approximately 15 in. (40 cm) of travel.
7. **Pull both slide rail release buttons toward you simultaneously and slide the server back into the rack.**
   The server should slide smoothly into the rack without binding.

FIGURE: Rail Mounting Bracket Release Button (Either Server)



8. **Verify that the CMA retracted without binding.**
9. **Adjust the cable straps and CMA as required to secure the cables.**
   See "Managing Cables With the CMA" on page 39.

Connecting the Server Cables for Both Servers

To boot the server, you must connect and configure the network and serial ports. The procedures are given in the following sections.

- "Managing Cables With the CMA" on page 39
- "Dismounting the Servers" on page 40

The servers also have serial and USB ports available for connections to optional devices. See "Port, Connector, and LED Locations for Both Servers" on page 12 for more information.

Note – When you are finished connecting the cables to the server, ensure that the server can slide smoothly in and out of the rack without binding or damaging the cables. See the section, "To Verify the Operation of the Slide Rails and the CMA" on page 32.

Related Information

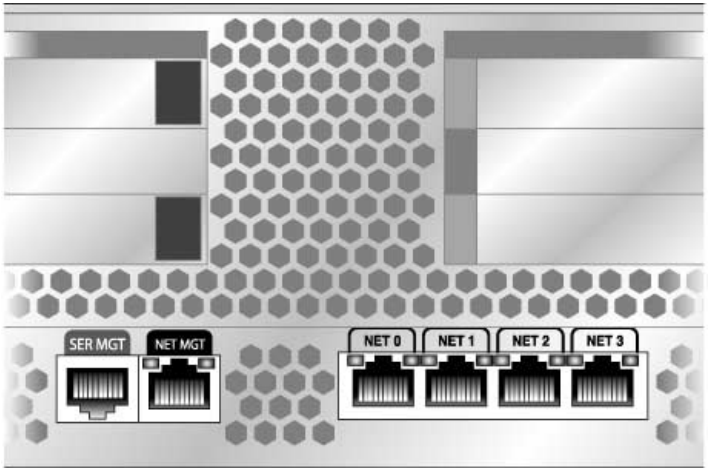
- "To Verify the Operation of the Slide Rails and the CMA" on page 32
- "To Connect the Service Processor Serial Management Port" on page 35
- "To Connect the Service Processor Network Management Port" on page 36

To Connect the Service Processor Serial Management Port

The service processor serial management port is marked SER MGT. This port is the farthest left RJ-45 port on the rear panel.

Note – The cable and DB-9 RJ-45 adapters are for the host serial port, and not for the server SER MGT port.

FIGURE: Service Processor Serial Management Port – Rear Panel



Use this port for server management. This port is needed to set up the service processor network management port, as detailed in "Enabling the Service Processor Network Management Port" on page 49.

Note – Use the service processor serial management port *only* for server management. This port is the default connection between the service processor and a terminal or a computer.

---

1. Connect a Category 5 cable from the SER MGT serial management port to the terminal device.
2. **When connecting either a DB-9 or a DB-25 cable, use an adapter to perform the crossovers given for each connector.**

Caution – Do not attach a modem to this port.

Related Information

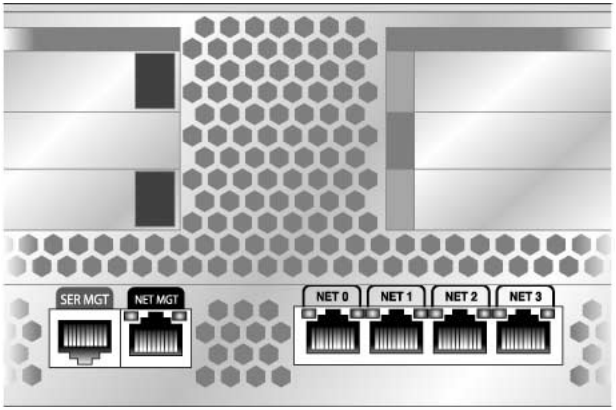
- "Enabling the Service Processor Network Management Port" on page 49
- "To Connect the Service Processor Network Management Port" on page 36

▼ To Connect the Service Processor Network Management Port

The service processor network management port is labeled NET MGT. This port is located just to the right of the serial management (SER MGT) port on the rear panel.

- **Connect a Category 5 cable from the NET MGT network management port to your network switch or hub.**

FIGURE: Service Processor Network Management Port – Rear Panel



Note – This port is not operational until you configure the network settings (through the serial management port), as detailed in "To Configure the Service Processor Network Management Port" on page 52.

Note – If you have access to a DHCP server on the network, you can see the service processor get an IP address because the DHCP client is enabled by default.

Note – The service processor network management port is configured by default to retrieve network settings with Dynamic Host Configuration Protocol (DHCP) and allow connections using Solaris Secure Shell (SSH). You might need to modify these settings for your network. Instructions are given in "Powering On the System" on page 43.

Related Information

- "To Connect the Ethernet Network Cables" on page 38

▼ To Connect the Ethernet Network Cables

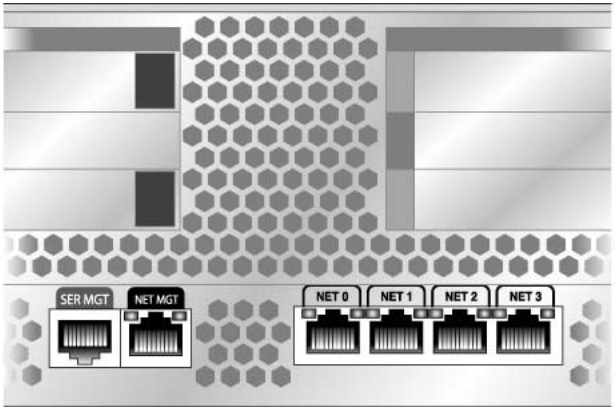
The server has four network connectors, marked NET0, NET1, NET2, and NET3. These connectors are RJ-45 Gigabit Ethernet.

1. **Connect a Category 5 cable from your network switch or hub to Ethernet Port 0 (NET0) on the rear of the chassis.**

   NET0 is the farthest left port in the 4-port network cluster.

2. **Connect Category 5 cables from your network switch or hub to the remaining Ethernet ports (NET1, NET2, NET3), as needed.**

FIGURE: Service Processor Ethernet Network Ports – Rear Panel



Related Information

- "To Connect the AC Power Cable to the Server" on page 38

▼ To Connect the AC Power Cable to the Server

Powering on the system for the first time requires special preparation and procedures. For example, if you have not prepared a display before connecting the AC power cable, system messages might be lost.

Caution – Finish the hardware procedures in this chapter, but do not attach the AC power cable yet.

Powering on the system for the first time requires special preparation and procedures. For example, if you have not prepared a display before connecting the AC power cable, system messages could be lost.

Caution – The server goes into Standby mode and the service processor initializes as soon as the AC power cable is connected to the power source.

- **Go to** "Powering On the System for the First Time" on page 43 **for instructions on connecting the server to AC power.**

Related Information

- "Powering On the System for the First Time" on page 43

Managing Cables With the CMA

Managing the cables with the CMA is the same for both servers.

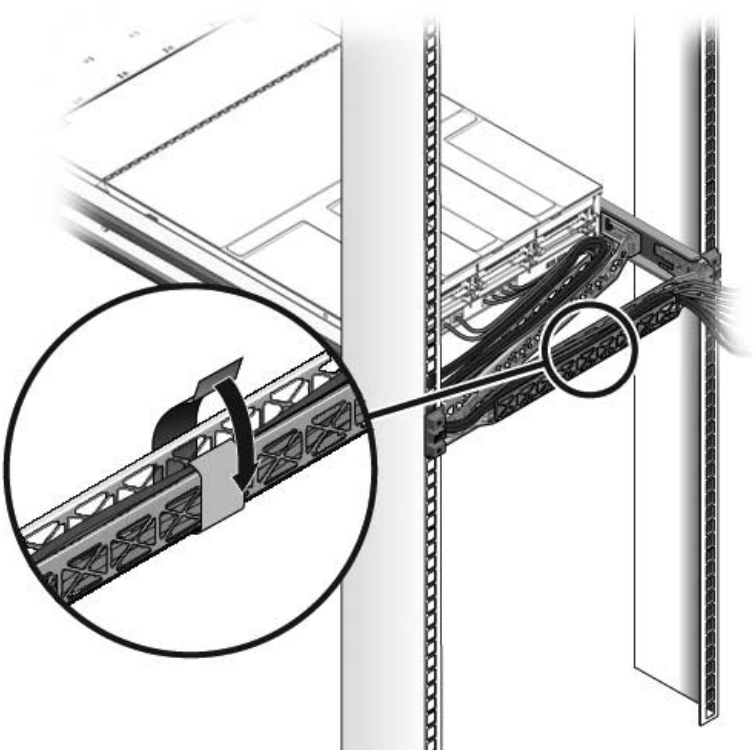
Related Information

- "To Secure the Server Cables in the CMA" on page 39

▼ To Secure the Server Cables in the CMA

- **Once the server cables are connected and placed inside the CMA, open the velcro cable straps and wrap the straps around the CMA securing the cables inside the CMA.**

FIGURE: Securing the Server Cables With the CMA and Velcro Straps (Either Server)



Caution – Verify the operation of the slide rails and CMA, and cable service loops. Perform the steps in the following procedure again before continuing: "To Verify the Operation of the Slide Rails and the CMA" on page 32.

Related Information

- "Dismounting the Servers" on page 40

Dismounting the Servers

To install or replace internal parts in the server, you must first remove the server from the rack.

Related Information

- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *SPARC Enterprise T5120 and T5220 Servers Service Manual*

Powering On the System

This chapter includes instructions for booting the servers and for enabling the service processor network management port.

This chapter contains the following topics:

- "Powering On the System for the First Time" on page 43
- "Enabling the Service Processor Network Management Port" on page 49
- "Logging Into the Service Processor" on page 51
- "Using the Service Processor for Common Operations" on page 56
- "Booting the Solaris Operating System" on page 61
- "Verifying System Functionality" on page 65

Powering On the System for the First Time

This section provides an overview and instructions for powering on your system the first time.

Related Information

- "ILOM System Console" on page 43
- "Enabling the Service Processor Network Management Port" on page 49
- "Verifying System Functionality" on page 65

ILOM System Console

When you power on the system, the boot process begins under the control of the Integrated Lights Out Manager (ILOM) system console. The system console displays status and error messages generated by firmware-based tests during system startup.

Note – To see these status and error messages, connect a terminal or terminal emulator to the serial management port (SER MGT). For a basic procedure to connect a terminal or terminal emulator, see "To Power On the System for the First Time" on page 44.

For a more detailed discussion on configuring the system console and connecting terminals, refer to the *SPARC Enterprise T5120 and T5220 Server Administration Guide*.

Related Information

- "ILOM Service Processor" on page 44
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide*

ILOM Service Processor

After the system console finishes its low-level system diagnostics, the ILOM service processor initializes and runs a higher level of diagnostics. When you access the ILOM service processor using a device connected to the serial management port, you see the output of the ILOM diagnostics.

By default, the service processor configures the network management port automatically, retrieving network configuration settings using the Dynamic Host Configuration Protocol (DHCP) and allowing connections using Secure Shell (SSH).

Note – If you are unable to use DHCP on your network, you must connect to the ILOM service processor using the serial management port to configure the network management port for your network.

Related Information

- "To Power On the System for the First Time" on page 44
- "To Configure the Service Processor Network Management Port" on page 52

▼ To Power On the System for the First Time

1. **Confirm that you have completed all of the preparations for installation.**

   See the instructions in "Preparing for Installation" on page 1.

2. **Confirm that you have completed the installation of the server in its rack.**

   See the instructions in "Installing the SPARC Enterprise T5120 and T5220 Servers" on page 19.

3. **Connect a terminal or a terminal emulator (PC or workstation) to the service processor serial management port.**

   Configure the terminal or terminal emulator with these settings:

   - 9600 baud
   - 8 bits
   - No parity
   - 1 Stop bit
   - No handshake

   A null modem configuration is needed, meaning the transmit and receive signals are reversed (crossed over) for DTE to DTE communications. You can use the supplied RJ-45 crossover adapters with a standard RJ-45 cable to achieve the null modem configuration.

Note – When you power on the server for the first time and you do not have a terminal or terminal emulator (PC or workstation) connected to the service processor serial management port, you will not see system messages.

   (Optional) Connect an Ethernet cable between the server's NET MGT port and the network to which future connections to the SP and host will be made.

4. **After the initial configuration of the system using the SP SER MGT port, communication with the SP and host is usually performed through this Ethernet interface.**

   Connect an Ethernet cable between one of the server's NET ports and the network to which the server will communicate.

FIGURE: Server Connections

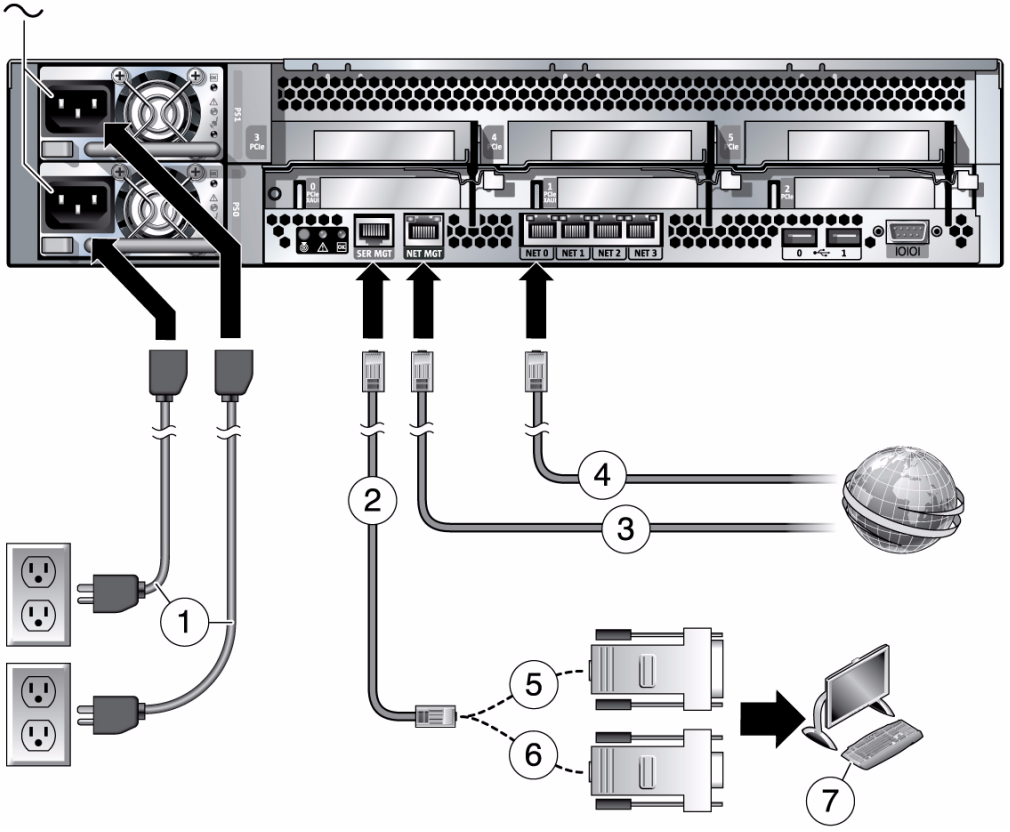


Figure Legend

1	Power Cables	**5**	RJ-45 to DB-25 crossover adapter
2	Ethernet cables	**6**	RJ-45 to DB-9 crossover adapter
3	Service processor to ethernet	**7**	Terminal device
4	NET MGT to network (optional)		

5. Plug the power cords into the power supplies and into separate power sources.

To provide redundancy, plug both power supplies into separate power sources.

Note – The system can operate with only one power connection, but there is no redundancy in this case.

The service processor runs on the 3.3V standby voltage. As soon as AC power is connected to the system, the service processor powers on, runs diagnostics, and initializes the ILOM firmware.

After a few minutes, the SP login prompt appears on the terminal device. The host is not initialized or powered on yet.

6. **At the terminal device, log in to the SP as `root` with a password of `changeme`.**

```
XXXXXXXXXXXXXXXX login: root
Password: changeme
. . .
->
```

After a brief delay, the SP prompt is displayed (->). At this point, there are many commands you can perform using the Integrated Lights Out Manager interface.

Additional SP information, such as how to change the password and how to set up the SP network parameters is available in the online documentation set.

7. **Power on the server and redirect the host output to display on the serial terminal device:**

```
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
-> start /SP/console
Are you sure you want to start /SP/CONSOLE (y/n)? y
Serial console started. To stop, type #.
. . .
```

After you start the SP console, the server initialization takes approximately 20 minutes to complete.

8. **When prompted, follow the onscreen instructions for configuring the Solaris Operating System on your host and enter the following configuration information.**

   You will be prompted to confirm the configuration several times, enabling confirmation and changes. If you are not sure how to respond to a particular value, you can accept the default, and make future changes when the Solaris OS is running.

Parameter	Description
Language	Select a number from the displayed language list.
Locale	Select a number from the displayed locale list.
Terminal Type	Select a terminal type that corresponds with your terminal device.
Network?	Select Yes.
Multiple Network Interfaces	Select the network interfaces that you plan to configure. If you are not sure, select the first one in the list.
DHCP?	Select Yes or No according to your network environment.
Host Name	Enter the host name for the server.
IP Address	Enter the IP address for this Ethernet interface.
Subnet?	Select Yes or No according to your network environment.
Subnet Netmask	(If subnet was Yes) Enter the netmask for the subnet for your network environment.
IPv6?	Specify whether or not to use IPv6. If you are not sure, select No to configure the Ethernet interface for IPv4.
Security Policy	Select either standard UNIX security (No) or Kerberos Security (Yes). If you are not sure, select No.
Confirm	Review the onscreen information and change it if needed. Otherwise, continue.
Name Service	Select the name service according to your network environment. Note–If you select a name service other than None, you will be prompted for additional name service configuration information.
NFSv4 Domain Name	Select the type of domain name configuration according to your environment. If you are not sure, select `Use the NFSv4 domain derived by the system`.
Time Zone (Continent)	Select your continent.
Time Zone (Country or Region)	Select your country or region.

Time Zone	Select the time zone.
Date and Time	Accept the default date and time or change the values.
root Password	Enter the `root` password twice. This password is for the superuser account for the Solaris OS on this server. This password is not the SP password.

9. **Log in to the server and explore its capabilities.**

   There are many commands you can use to verify the functionality of the system. The following list describes a few of them:

   - `showrev` – Displays the hostname and system architecture information. Use the `-a` option with this command to see the patches that are installed.
   - `psrinfo` – Displays information about the number and status of the processors and cores in the host.
   - `prtdiag` – Displays system configuration and diagnostic information.

   Review the Solaris OS man pages and documentation for more details.

Related Information

- "Enabling the Service Processor Network Management Port" on page 49
- Solaris Documentation
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide*.

Enabling the Service Processor Network Management Port

The service processor network management port is not operational unless your network employs DHCP, in which case the configuration in automatic. If you network uses DHCP, you can run this command to view your server's network configuration information:

```
-> show /SP/network
```

For example:

```
-> show /SP/network

  /SP/network
     Targets:
```

```
        Properties:
            commitpending = (Cannot show property)
            dhcp_server_ip = 10.8.31.5
            ipaddress = 10.8.31.188
            ipdiscovery = dhcp
            ipgateway = 10.8.31.248
            ipnetmask = 255.255.252.0
            macaddress = 00:14:4F:7E:83:4F
            pendingipaddress = 10.8.31.188
            pendingipdiscovery = dhcp
            pendingipgateway = 10.8.31.248
            pendingipnetmask = 255.255.252.0
            state = enabled

        Commands:
            cd
            set
            show
```

If your network does *not* use DHCP, the network management port is not operational until you configure network settings for the service processor. Configure the service processor in this order:

1. After the service processor boots, access the ILOM CLI through the serial management port. See "To Log Into the Service Processor Using the Serial Management Port" on page 51.
2. Configure the service processor. See "To Configure the Service Processor Network Management Port" on page 52.
3. Commit the changes to the service processor parameters. See Step 3 in "To Configure the Service Processor Network Management Port" on page 52.

You can now use the network management port at any time to access the service processor.

See "To Log Into the Service Processor Using the Network Management Port" on page 55.

Related Information

- "Logging Into the Service Processor" on page 51

Logging Into the Service Processor

If you are powering on the system for the first time after installation, use the service processor serial port to power on the system and run POST. See "To Log Into the Service Processor Using the Serial Management Port" on page 51.

If the network management port has already been configured, you can use it instead of the serial management port.

Related Information

- "To Log Into the Service Processor Using the Serial Management Port" on page 51
- "To Log Into the Service Processor Using the Network Management Port" on page 55

▼ To Log Into the Service Processor Using the Serial Management Port

After the service processor boots, access the ILOM CLI to configure and manage the system. The ILOM CLI prompt (->) is displayed at the first time the service processor is booted. The default configuration provides an ILOM CLI `root` user account. The default `root` password is *changeme*. Change the password using the service processor ILOM CLI password command.

1. **If this is the first time the system has been powered on, use the `password` command to change the `root` password.**

```
...
Starting OpenBSD Secure Shell server: sshd.
Starting Servicetags listener: stlistener.
Starting FRU update program: frutool.

hostname login: root
Password: changeme

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...
```

```
Warning: password is set to factory default.

-> set /SP/users/root password
Enter new password: ********
Enter new password again: ********

->
```

Note – After the `root` password has been set, on subsequent reboots, the ILOM CLI login prompt is displayed.

2. Enter `root` for the login name followed by your password.

```
...
hostname login: root
Password: password (nothing displayed)
Waiting for daemons to initialize...

Daemons ready

Integrated Lights Out Manager

Version 2.0.0.0

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->
```

Related Information

- "To Configure the Service Processor Network Management Port" on page 52
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide*

▼ To Configure the Service Processor Network Management Port

Note – If your network allows the use of DHCP, this configuration is performed automatically the first time you boot the system.

Use this procedure only when:

- You are unable to use DHCP on your network.
- You need to modify the ILOM service processor network management port settings.

In this procedure, you connect to the ILOM service processor using the serial management port to manually reconfigure the network management port.

Note – For more information on configuring ILOM, refer to the *Integrated Lights Out Manager 2.0 Supplement for SPARC Enterprise T5120 and T5220 Servers.*

Set these network parameters according to the specific details of your network configuration:

- `/SP/network state` – Specifies whether the service processor is on the network or not
- `/SP/network pendingipaddress` – IP address of the service processor
- `/SP/network pendingipgateway` – IP address of the gateway for the subnet
- `/SP/network pendingipnetmask` – Netmask for the service processor subnet
- `/SP/network pendingipdiscovery` - Specifies whether the service processor uses DHCP or static IP address assignment
- `/SP/network commitpending` - Commits the service processor to use the pending settings

Configure these parameters with the `set` command. The usage is as follows: `set` *target property=value* where `/SP/network` is the target and `pendingipaddress=`*xxx.xxx.xxx.xxx*, for example, is the *property=value*.

1. **Configure the service processor using information from your network administrator.**

   Your choices are:

   - `dhcp` - Set up the network connection with a dynamically created IP configuration. If you choose to use a dynamically created IP address (use DHCP to retrieve the network setting), set `pendingipdiscovery` to `dhcp`.

```
-> set /SP/network pendingipdiscovery=dhcp
Set 'pendingipdiscovery' to 'dhcp'
```

   - `static` - Set up the network connection with a static IP configuration. If you choose to configure a static IP configuration. set the parameters `pendingipdiscovery`, `pendingipaddress`, `pendingipgateway`, and `pendingipnetmask` as follows.

a. Set the service processor to accept a Static IP Address.

```
-> set /SP/network pendingipdiscovery=static
Set 'pendingipdiscovery' to 'static'
```

b. Set the IP address for the service processor.

```
-> set /SP/network pendingipaddress=service-processor-IPaddr
Set 'pendingipaddress' to 'service-processor-IPaddr'
```

c. Set the IP address for the service processor gateway.

```
-> set /SP/network pendingipgateway=gateway-IPaddr
Set 'pendingipgateway' to 'gateway-IPaddr'
```

d. Set the netmask for the service processor.

```
-> set /SP/network pendingipnetmask=255.255.255.0
Set 'pendingipnetmask' to '255.255.255.0'
```

This example uses `255.255.255.0` to set the netmask. Your network environment subnet might require a different netmask. Use a netmask number most appropriate to your environment.

2. Use the `show /SP/network` command to verify that the parameters were set correctly.

The code example shows parameters that have been set to convert a service processor from a DHCP configuration to a static configuration.

```
-> show /SP/network
  /SP/network
     Targets:
     Properties:
         commitpending = (Cannot show property)
         dhcp_server_ip = xxx.xxx.xxx.xxx
         ipaddress = xxx.xxx.xxx.xxx
         ipdiscovery = dhcp
         ipgateway = xxx.xxx.xxx.xxx
         ipnetmask = 255.255.252.0
         macaddress = 00:14:4F:3F:8C:AF
         pendingipaddress = xxx.xxx.xxx.xxx
         pendingipdiscovery = static
         pendingipgateway = xxx.xxx.xxx.xxx
         pendingipnetmask = 255.255.255.0
         state = enabled
     Commands:
         cd
```

```
          set
          show
->
```

Note – After setting the configuration parameters, you must enter the `set /SP/network commitpending=true` command for the new values to take affect.

3. Commit the changes to the service processor network parameters.

```
-> set /SP/network commitpending=true
Set 'commitpending' to 'true'
```

Note – You can run the `show /SP/network` command again (after performing the `set /SP/network commitpending=true` command) to verify that the parameters have been updated.

Related Information

- "To Log Into the Service Processor Using the Network Management Port" on page 55
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide*

▼ To Log Into the Service Processor Using the Network Management Port

Note – You must configure the service processor parameters shown in "To Configure the Service Processor Network Management Port" on page 52 before you can use the network management port.

- **Open an SSH session and connect to the service processor by specifying its network address.**

```
% ssh root@xx.xxx.xx.x
...
Are you sure you want to continue connecting (yes/no)? yes
...
Password: password (nothing displayed)
Waiting for daemons to initialize...
```

```
Daemons ready

Sun(TM) Integrated Lights Out Manager

Version 2.0.0.0

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->
```

Related Information

- "To Perform a Normal System Initialization" on page 58

Using the Service Processor for Common Operations

The following topics are described in this section:

- "To Power On the System" on page 56
- "To Connect to the System Console" on page 58
- "To Perform a Normal System Initialization" on page 58

▼ To Power On the System

1. **Perform the following steps to verify that there are no faults:**

   a. **Set the virtual keyswitch to `diag` mode so that POST will run in Service mode.**

```
-> set /SYS keyswitch_state=diag
```

   b. **To initiate the power-on sequence, type the `start /SYS` command.**

      An ILOM CLI alert message appears on the system console. This message indicates that the system has reset.

```
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
```

```
Starting /SYS

->
```

c. Switch to the system console to view POST output.

```
-> start /SP/console
Are you sure you want to start /SP/console (y/n)? y
Serial console started.  To stop, type #.
.
.
.
```

Watch the POST output for possible fault messages. The following output is a sign that POST did not detect any faults:

```
.
.
.
2007-12-14 16:34:53.385 0:1:0>INFO:
2007-12-14 16:34:53.391 0:1:0>  POST Passed all devices.
2007-12-14 16:34:53.399 0:1:0>POST:     Return to VBSC.
2007-12-14 16:34:53.406 0:1:0>Master set ACK for vbsc runpost
command and spin.
...
SPARC Enterprise T5220, No Keyboard
Copyright 2007 Sun Microsystems, Inc.  All rights reserved.
OpenBoot 4.27.x, 3968 MB memory available, Serial #74409918.
Ethernet address 0:14:4f:6f:67:be, Host ID: 846f67be.


{8} ok
```

2. Type the console escape sequence (by default `#.` (Hash-Period)) to return to the ILOM prompt.

3. Check the POST execution result with the following command:

```
-> show /SP/faultmgmt -level all
```

Note – Depending on the configuration of ILOM, POST variables, and whether POST detected faults or not, the server might boot, or the system might remain at the `ok` prompt. If the system is at the `ok` prompt, type **`boot`**.

---

4. **Use the** `set /SYS keyswitch_state=normal` **command to return the virtual keyswitch to Normal mode (default) so that the system can power on and start the boot process.**

```
-> set /SYS keyswitch_state=normal
```

Related Information

- "To Connect to the System Console" on page 58

▼ To Connect to the System Console

Output from POST, OpenBoot, and the Solaris OS is displayed in the system console using the network console on the service processor.

- **Type the** `start /SP/console` **command.**

  Multiple users can be connected to the console, but only one can be attached.

```
-> start /SP/console
Are you sure you want to start /SP/console (y/n)? y
Serial console started.  To stop, type #.
```

Note – For more information about POST output, refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

Related Information

- "To Perform a Normal System Initialization" on page 58
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Service Manual*

▼ To Perform a Normal System Initialization

1. **Type the** `start /SYS` **command.**

```
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
Starting /SYS
```

2. **To initiate the power-on sequence, type the `start /SP/console` command.**

   You will see an ILOM CLI alert message on the system console. This message indicates that the system has reset.

```
-> start /SP/console
Are you sure you want to start /SP/console (y/n)? y
Serial console started.  To stop, type #.
```

   The CPU and memory controllers initialize, and eventually OpenBoot initializes. After a number of system console messages, the `ok` prompt appears, or the system will boot into the Solaris OS.

Note – System behavior depends on how the `auto-boot` variable is set. See the *SPARC Enterprise T5120 and T5220 Servers Administration Guide* for more information.

   The following example output is a small section of the complete output.

```
0:1:0>
0:1:0>SPARC-Enterprise[TM] T5120/T5220 POST 4.27.x.
2007/12/11 18:55

...

0:1:0>Network Interface Unit Tests....Done
0:1:0>Functional CPU Tests....Done
0:1:0>Extended Memory Tests....Done
2007-12-14 16:45:28.800 0:1:0>INFO:
2007-12-14 16:45:28.806 0:1:0>  POST Passed all devices.
2007-12-14 16:45:28.816 0:1:0>POST:     Return to VBSC.
2007-12-14 16:45:28.824 0:1:0>Master set ACK for vbsc runpost
command and spin...


SPARC Enterprise T5220, No Keyboard
Copyright 2007 Sun Microsystems, Inc.  All rights reserved.
OpenBoot 4.27.x, 3968 MB memory available, Serial #74409918.
Ethernet address 0:14:4f:6f:67:be, Host ID: 846f67be.


{0} ok
```

Related Information

- "Devices in the OpenBoot Device Tree" on page 60
- Integrated Lights Out Manager (ILOM) 2.0 Documentation

- *Integrated Lights Out Manager (ILOM) 2.0 Supplement for SPARC Enterprise T5120 and T5220 Servers*
- Integrated Lights Out Manager (ILOM) 3.0 Documentation
- *Integrated Lights Out Manager (ILOM) 3.0 Supplement for SPARC Enterprise T5120 and T5220 Servers*
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide*

Devices in the OpenBoot Device Tree

Some OpenBoot device tree path names are shown below:

TABLE: Disk Slot Numbers, Logical Device Names, and Physical Device Names

Disk Slot Number	Logical Device Name*	Physical Device Name
Slot 0	`c1t0d0`	`/devices/pci@0/pci@0/pci@2/scsi@0/sd@0,0`
Slot 1	`c1t1d0`	`/devices/pci@0/pci@0/pci@2/scsi@0/sd@1,0`
Slot 2	`c1t2d0`	`/devices/pci@0/pci@0/pci@2/scsi@0/sd@2,0`
Slot 3	`c1t3d0`	`/devices/pci@0/pci@0/pci@2/scsi@0/sd@3,0`

* The logical device names might appear differently on your system, depending on the number and type of add-on disk controllers installed.

TABLE: Device Identifiers and Devices

Device Identifiers	Devices
`/SYS/MB/CMP`*cpu_number*`/P`*strand_number*	CPU strand (Number: 0-63)
`/SYS/MB/RISER`*riser_number*`/PCIE`*slot_number*	PCIe slot (Number: 0-5)
`/SYS/MB/RISER`*riser_number*`/XAUI`*card_number*	XAUI card (Number: 0-1)
`/SYS/MB/GBE`*controller_number*	GBE controllers (0-1) • `GBE0` controls `NET0` and `NET1` • `GBE1` controls `NET2` and `NET3`
`/SYS/MB/PCIE`	PCIe root complex
/SYS/MB/USB*number*	USB ports (Number: 0-1, located on rear of chassis)

TABLE: Device Identifiers and Devices *(Continued) (Continued)*

Device Identifiers	Devices
/SYS/MB/CMP0/L2_BANK*number*	(Number: 0-3)
/SYS/DVD	DVD
/SYS/USBBD/USB*number*	USB ports (Number: 2-3, located on front of chassis)
`/SYS/TTYA`	DB9 serial port
`/SYS/MB/CMP0/BR`*branch_number*`/CH`*channel_number*/D*dimm_number*	Branch (0-1) Channel (0-1) DIMM (0-3)

Related Information

- "Booting the Solaris Operating System" on page 61
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide*

Booting the Solaris Operating System

The Solaris OS is preinstalled on the servers on the disk in slot 0. The Solaris OS is not configured (that is, the `sys-unconfig` command was run in the factory). If you boot the system from this disk, you will be prompted to configure the Solaris OS for your environment.

Related Information

- "To Boot the Solaris Operating System" on page 61
- "To Avoid Booting the Solaris Operating System at Startup" on page 63
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide*

▼ To Boot the Solaris Operating System

1. **At the `ok` prompt, boot from the disk that contains the Solaris OS.**
   - If you know which disk to boot from, skip this step and perform Step 2.

- If you need to determine which disk to boot from, type the `show-disks` command at the `ok` prompt to see the path to the configured disks, similar to the following:

```
ok show-disks
a) /pci@7c0/pci@0/pci@2/pci@0,2/LSILogic,sas@4/disk
q) NO SELECTION
Enter Selection, q to quit: q
ok
```

2. **Type the `boot` command at the `ok` prompt.**

   Use the value from Step 1 to construct the `boot` command. You must append the target to the disk path.

   In the following example, the server is booted from disk 0 (zero) on a SPARC Enterprise T5120 server.

```
ok boot disk0
Boot device: /pci@7c0/pci@0/pci@8/scsi@2/disk@0,0
File and args:
Notice: Unimplemented procedure 'encode-unit' in
/pci@7c0/pci@0/pci@2/pci@0/LSILogic,sas@4
Loading ufs-file-system package 1.4 04 Aug 1995 13:02:54.
FCode UFS Reader 1.12 00/07/17 15:48:16.
Loading: /platform/SUNW,T5120/ufsboot
Loading: /platform/sun4v/ufsboot
...................
Hostname: hostname
The system is coming up. Please wait.
NIS domain name is x.x.x.x
starting rpc services: rpcbind keyserv ypbind done.
Setting netmask of lo0 to 255.0.0.0
Setting netmask of bge0 to 255.255.255.0
Setting default IPv4 interface for multicast: add net 224.0/4:
gateway xxxx
syslog service starting.
volume management starting.
Creating new rsa public/private host key pair
Creating new dsa public/private host key pair
The system is ready.
hostname console login:
```

Related Information

- "To Avoid Booting the Solaris Operating System at Startup" on page 63
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide*

▼ To Avoid Booting the Solaris Operating System at Startup

In hard drive HDD0, the Solaris OS is preinstalled.

- **If you do not want to start the preinstalled OS, set the Open Boot PROM parameter `auto-boot?` to `false`. For example:**

```
-> set /HOST/bootmode script="setenv auto-boot? false"
```

Related Information

- "To Reset the System" on page 63
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide*

▼ To Reset the System

1. **If it is necessary to reset the system, use the `shutdown -g0 -i6 -y` command**

```
# shutdown -g0 -i6 -y
```

2. **It is not necessary to power the system off and on to simply reset the system.**

Related Information

- "To Power Cycle the System" on page 64
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide*

▼ To Power Cycle the System

If a simple reset does not clear a system problem, you can power the system off and on with this procedure.

1. **Shut down the Solaris OS.**

   At the Solaris OS prompt, type the `shutdown -g0 -i0 -y` command. Then type **o** when prompted to halt the Solaris OS and to return to the ok prompt.

```
# shutdown -g0 -i0 -y
# svc.startd: The system is coming down.  Please wait.
svc.startd: 91 system services are now being stopped.
Jun 12 19:46:57 wgs40-58 syslogd: going down on signal 15
svc.startd: The system is down.
syncing file systems... done
Program terminated
r)eboot, o)k prompt, h)alt?
```

2. **Switch from the system console prompt to the service processor console prompt by typing the console escape sequence (by default, `#.` [Hash-Period]).**

```
ok #.
->
```

3. **Using the ILOM CLI, type the `stop /SYS` command to perform a graceful shutdown of the system.**

```
-> stop /SYS
Are you sure you want to stop /SYS (y/n)? y
Stopping /SYS

->
```

Note – To perform an immediate and ungraceful shutdown, use the `stop -force -script /SYS` or `stop -script /SYS` commands. These commands stop everything immediately, so ensure that all data is saved before entering these commands.

---

4. **Type the `start /SYS` command.**

```
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
Starting /SYS

->
```

Note – To force a power-on sequence, use the `start -script /SYS` command.

5. **Reconnect to the system console with the `start /SP/console` command.**

```
-> start /SP/console
Are you sure you want to start /SP/console (y/n)? y
Serial console started.  To stop, type #.
```

The systems displays various messages, followed by the `ok` prompt.

Related Information

- "Verifying System Functionality" on page 65
- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide*

Verifying System Functionality

After powering on the system for the first time, you can use the Sun Validation Test Suite (Sun VTS) software to verify the functionality and performance of any installed components, as well as its network connections.

Related Information

- SunVTS Documentation

Updating the Firmware

This section provides instructions for updating SP firmware.

Related Information

- "`flashupdate` command" on page 67
- "To Update the Firmware" on page 68

`flashupdate` command

The `flashupdate` command updates both the service processor firmware and the server firmware.

The flash image consists of the following components:

- Service processor firmware
- OpenBoot PROM
- POST
- Reset/config
- Sequencer
- Partition description

Related Information

- "To Update the Firmware" on page 68

▼ To Update the Firmware

1. **Ensure that the ILOM service processor network management port is configured.**

   This configuration is required to access the new flash image over the network. See "To Configure the Service Processor Network Management Port" on page 52.

2. **Open an SSH session to connect to the service processor.**

```
% ssh root@xx.xxx.xx.x
...
Are you sure you want to continue connecting (yes/no)? yes
...
Password: password (nothing displayed)
Waiting for daemons to initialize...

Daemons ready

Sun(TM) Integrated Lights Out Manager

Version 2.0.0.0

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->
```

3. **Verify that the host is powered off.**

   If the host is not powered off, type the `stop /SYS` command.

```
-> stop /SYS
```

4. **Verify that the `keyswitch_state` parameter is set to `normal`.**

```
-> set /SYS keyswitch_state=normal
```

5. **Type the `load` command.**

   The `load` command updates the service processor flash image and the host firmware. The `load` command requires the following information:

   - IP address of a TFTP server on the network that can access the flash image

- Full path name to the flash image that the IP address can access

The command usage is as follows:

`load [-script] -source tftp://`*xxx.xxx.xx.xx/pathname*

where:

- `-script` – Does not prompt for confirmation and acts as if yes was specified
- `-source` – Specifies the IP address and full path name (URL) to the flash image

```
-> load -source tftp://xxx.xxx.xx.xx/pathname
 NOTE: A firmware upgrade will cause the server and ILOM to
       be reset. It is recommended that a clean shutdown of
       the server be done prior to the upgrade procedure.
       An upgrade takes about 6 minutes to complete. ILOM
       will enter a special mode to load new firmware. No
       other tasks can be performed in ILOM until the
       firmware upgrade is complete and ILOM is reset.

Are you sure you want to load the specified file (y/n)? y
Do you want to preserve the configuration (y/n)? y
.............................................................

Firmware update is complete.
ILOM will now be restarted with the new firmware.
Update complete. Reset device to use new image.

->
```

After the flash image has been updated, the system automatically resets.

The service processor resets, runs diagnostics, and returns to the login prompt (on the serial console), similar to this code example:

```
U-Boot 1.1.1 (May 23 2007 - 21:30:12)
...
POST cpu PASSED
POST ethernet PASSED
Hit any key to stop autoboot:  0
## Booting image at fe080000 ...

IP Protocols: ICMP, UDP, TCP, IGMP

Checking all file systems...
fsck 1.37 (21-Mar-2005)
Setting kernel variables ...
... done.
Mounting local filesystems...
Cleaning /tmp /var/run /var/lock.
```

```
Identifying DOC Device Type(G3/G4/H3) ...
OK

Configuring network interfaces...Internet Systems Consortium DHCP
Client V3.0.1
Copyright 2007 Internet Systems Consortium.
All rights reserved.
For info, please visit http://www.isc.org/products/DHCP

eth0: config: auto-negotiation on, 100FDX, 100HDX, 10FDX, 10HDX.
Listening on LPF/eth0/00:14:4f:3f:8c:af
Sending on   LPF/eth0/00:14:4f:3f:8c:af
Sending on   Socket/fallback
DHCPDISCOVER on eth0 to 255.255.255.255 port 67 interval 6
eth0: link up, 100 Mbps Full Duplex, auto-negotiation complete.
DHCPDISCOVER on eth0 to 255.255.255.255 port 67 interval 15
Hostname: hostname.
Starting portmap daemon: portmap.
Initializing random number generator...done.
INIT: Entering runlevel: 3
Starting system log daemon: syslogd and klogd.
Starting periodic command scheduler: cron.
Starting IPMI Stack..... Done.
Starting OpenBSD Secure Shell server: sshd.
Starting Servicetags listener: stlistener.
Starting FRU update program: frutool.

hostname login:
```

Related Information

- "To Configure the Service Processor Network Management Port" on page 52

Selecting a Boot Device

This section provides instructions on selecting a boot device:

Related Information

- "Selecting a Boot Device" on page 71
- "To Select a Boot Device" on page 72

Selecting a Boot Device

You specify the boot device by setting an OpenBoot configuration variable called `boot-device`. The default setting of this variable is `disk net`. Because of this setting, the firmware first attempts to boot from the system hard drive, and if that fails, from the on-board NET0 Gigabit Ethernet interface.

This procedure assumes that you are familiar with the OpenBoot firmware and that you know how to enter the OpenBoot environment. For more information, see the *SPARC Enterprise T5120 and T5220 Servers Administration Guide*.

Note – The serial management port on the ILOM card is preconfigured as the default system console port. For more information, see the *SPARC Enterprise T5120 and T5220 Servers Overview*.

If you want to boot from a network, you must connect the network interface to the network.

▼ To Select a Boot Device

- **At the `ok` prompt, type:**

```
ok setenv boot-device device-specifier
```

where the *device-specifier* is one of the following:

- `cdrom` – Specifies the DVD drive
- `disk` – Specifies the system boot disk (internal disk 0 by default)
- `disk0` – Specifies internal drive 0
- `disk1` – Specifies internal drive 1
- `disk2` – Specifies internal drive 2
- `disk3` – Specifies internal drive 3
- `net`, `net0`, `net1`, `net2`, `net3` – Specifies the network interfaces
- *full path name* – Specifies the device or network interface by its full path name

---

Note – The Solaris OS modifies the `boot-device` variable to its full path name, not the alias name. If you choose a nondefault `boot-device` variable, the Solaris OS specifies the full device path of the boot device.

Note – You can specify the name of the program to be booted as well as the way the boot program operates. For more information, refer to the *OpenBoot 4.x Command Reference Manual* for your specific Solaris OS release. This document is available at: `(http://www.sun.com/documentation)`

If you want to specify a network interface other than an on-board Ethernet interface as the default boot device, you can determine the full path name of each interface by typing either of the following commands:

```
ok show-devs
ok show-nets
```

The `show-devs` command lists the system devices and displays the full path name of each PCI device.

Related Information

- OpenBoot Documentation
- *OpenBoot 4.x Command Reference Manual*

Installing the Servers With the Express Rail Rackmounting Kit

This section provides instructions for installing the servers in an equipment rack with express (snap-in) rails. The express rail rackmounting kit installs quickly, and does not require mounting screws or nuts. The kit and the installation procedures are the same for both the SPARC Enterprise T5120 and T5220 servers.

Note – If your rackmounting kit came with its own instructions, use the instructions in your rackmounting kit instead of the instructions in this section. After performing the server installation, proceed to "Powering On the System" on page 43 for first-time power on.

Note – The procedures in this section are the same for both the 1U and 2U servers. The illustrations show a 2U server only as an example.

This chapter contains the following sections:

- "Slide Rail Assembly Notes for the Express Rail Rackmounting Kit" on page 74
- "Installing the Servers in a Rack With Express Rails" on page 76
- "Installing the Cable Management Arm" on page 83
- "Dismounting the Server" on page 84

Note – References to *left* and *right* are from your viewpoint as you face either the front or the rear of the system.

Related Information

- "Slide Rail Assembly Notes for the Express Rail Rackmounting Kit" on page 74
- "Installing the Servers in a Rack With Express Rails" on page 76

Slide Rail Assembly Notes for the Express Rail Rackmounting Kit

The express rail rackmounting kit has two *slide rail assemblies*. A slide rail assembly can be installed on either the right or left side of the rack.

Each slide rail assembly consists of a three-section slide rail and a removable mounting bracket.

FIGURE: Sections of the Express Rail Slide Rail Assembly

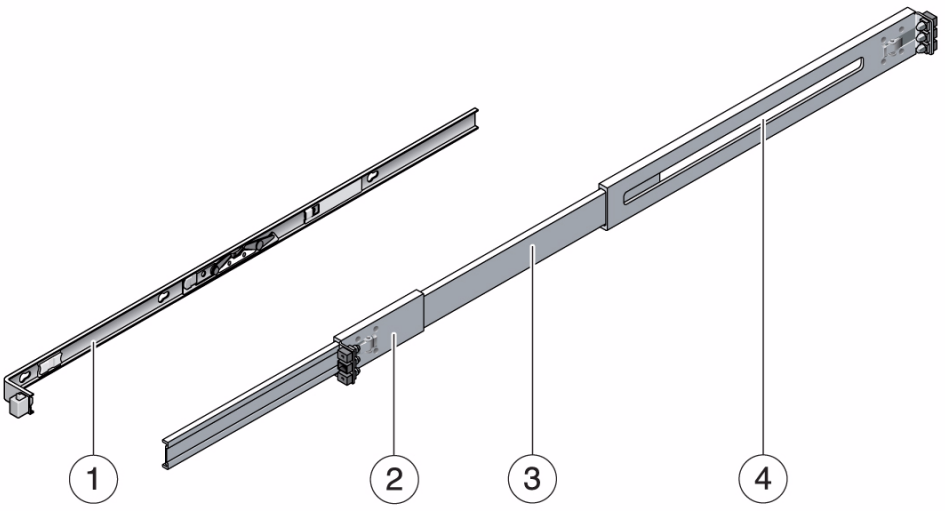


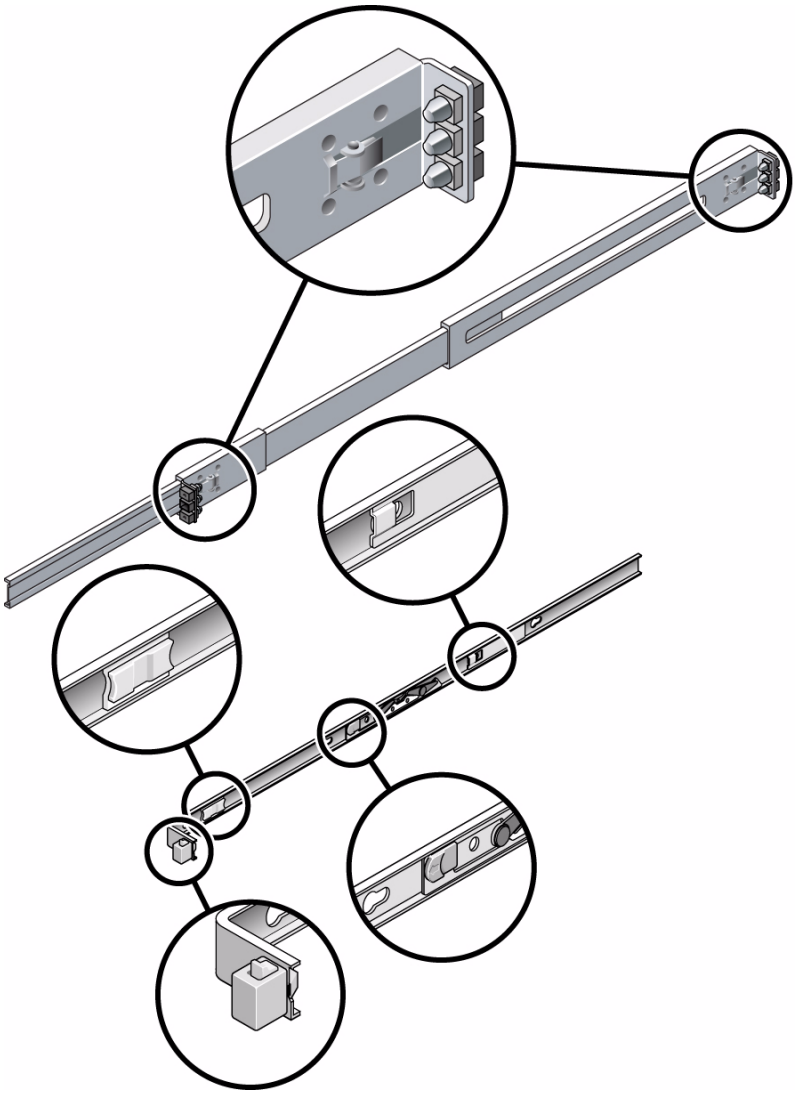
Figure Legend

1	Mounting bracket
2	Front section
3	Middle section
4	Rear section

- The *front*, *middle*, and *rear* sections form the *slide rail*. The middle and rear sections have holes for mounting and adjust to fit rack depths from 24 in. (61 cm) to 36.5 in. (93 cm). The front section can be extended to allow movement of the server out of the rack.

- The removable *mounting bracket* slides 14.5 in. (37 cm) out of the slide rail, then locks in place. If you unlock the mounting bracket at this point, it slides an additional 14.5 in. (37 cm) before separating from the slide rail. You can then mount the mounting bracket to the right or left side of the server chassis.
- Note that there are six locks in a slide rail assembly. Four are on the mounting bracket. Two locks are on the slide rail.

FIGURE: Locating the Locks on the Slide Rail Assembly for the SPARC Enterprise T5220 Server



Related Information

- "Installing the Servers in a Rack With Express Rails" on page 76

Installing the Servers in a Rack With Express Rails

Note – Ensure that you have all of the parts in the rackmounting kit before you begin installation.

The rackmounting kit contains two slide rail assemblies, which can be installed on either the right or left side of the rack.

A slide rail assembly consists of two parts, a slide rail and a removable mounting bracket. The slide rail attaches to the rack posts. The mounting bracket attaches to the server chassis.

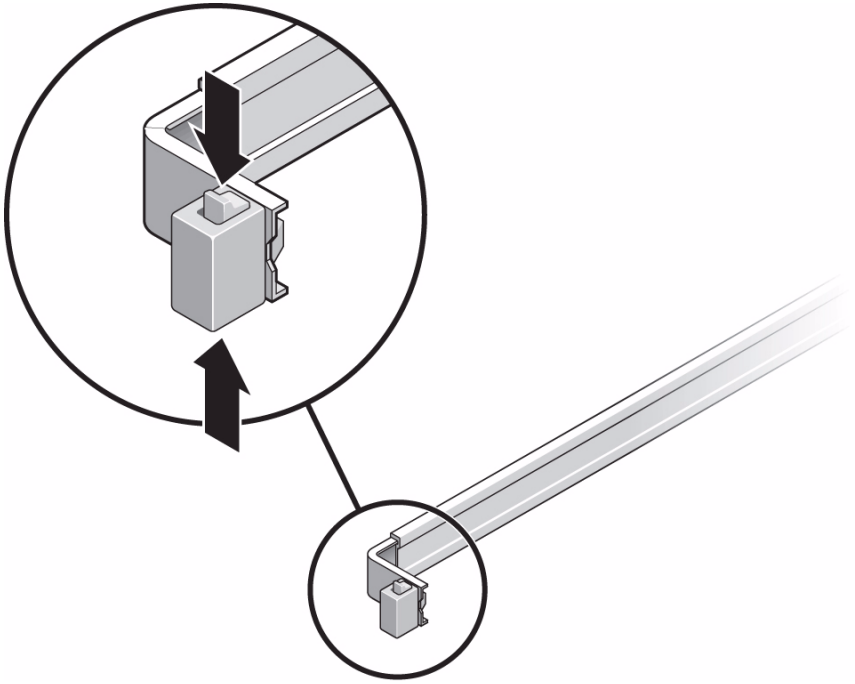
Related Information

- "To Install the Slide Rail Assemblies" on page 76

▼ To Install the Slide Rail Assemblies

1. **Pull both mounting brackets completely out of their respective slide rails.**
   a. **Simultaneously press and hold the upper and lower lock buttons of the slide rail lock.**

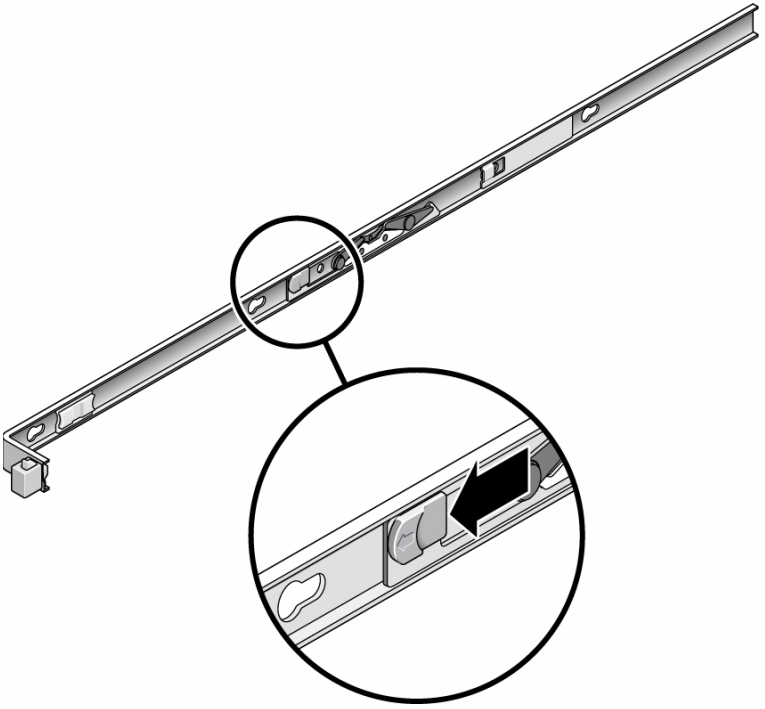
FIGURE: Unlocking the Express Rail Slide Rail Assembly



b. Pull the mounting bracket out until it stops.

c. Slide the mounting bracket release button to the left, then slide the mounting bracket completely out of the slide rail.

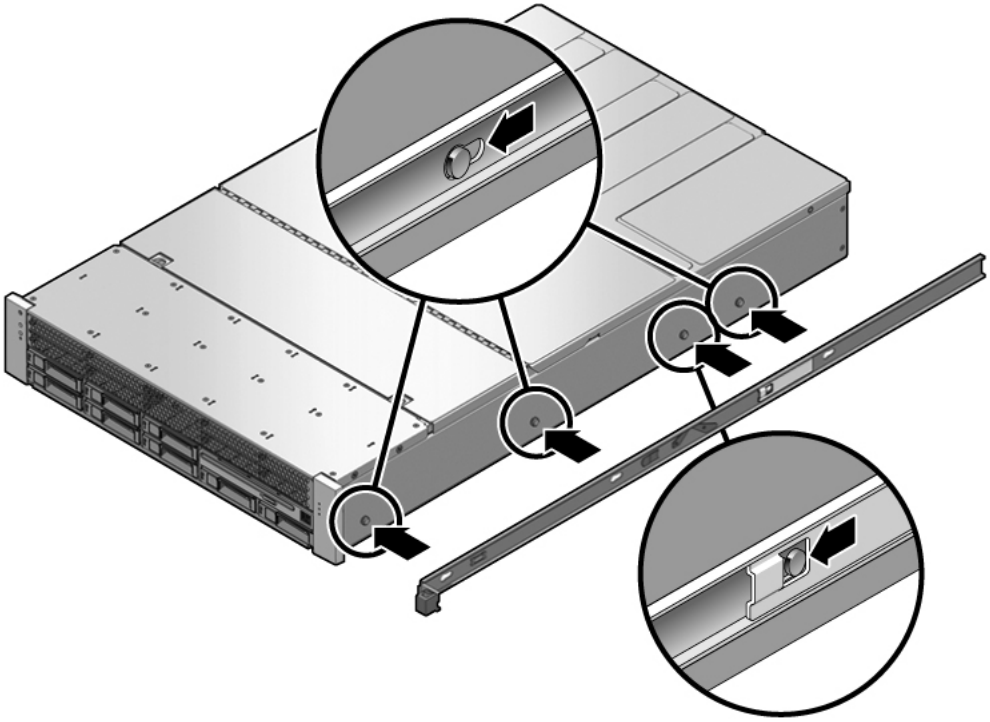
FIGURE: Express Rail Mounting Bracket Release Button



2. **Attach a mounting bracket to the right side of the server chassis.**

   a. **Position the mounting bracket against the chassis. Ensure that the slide rail lock is at the front and the keyed openings on the mounting bracket are aligned with the locating pins on the side of the chassis.**

FIGURE: Attaching an Express Rail Mounting Bracket to the Chassis



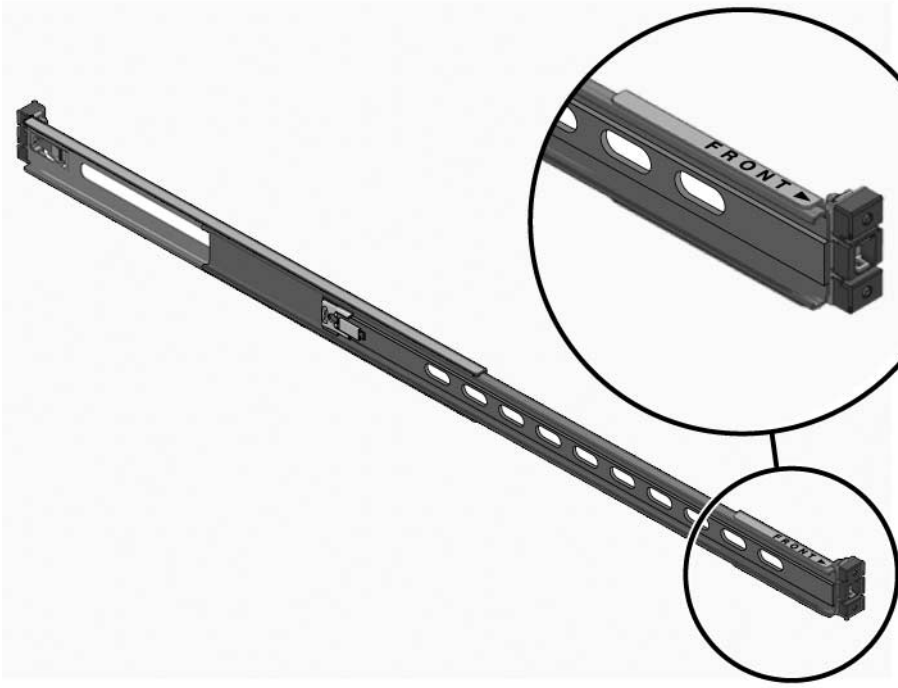
b. Ensure that the heads of the four locating pins protrude through the keyed openings in the mounting bracket. Slide the mounting bracket toward the front of the chassis until the bracket locks into place with an audible click.

c. Verify that all four locating pins are trapped in the keyed openings and that the third locating pin from the front has engaged the mounting bracket lock.

3. Attach the second mounting bracket to the left side of the server chassis.

4. Orient slide rails, ensuring that the ball bearing tracks (labeled FRONT) are forward.

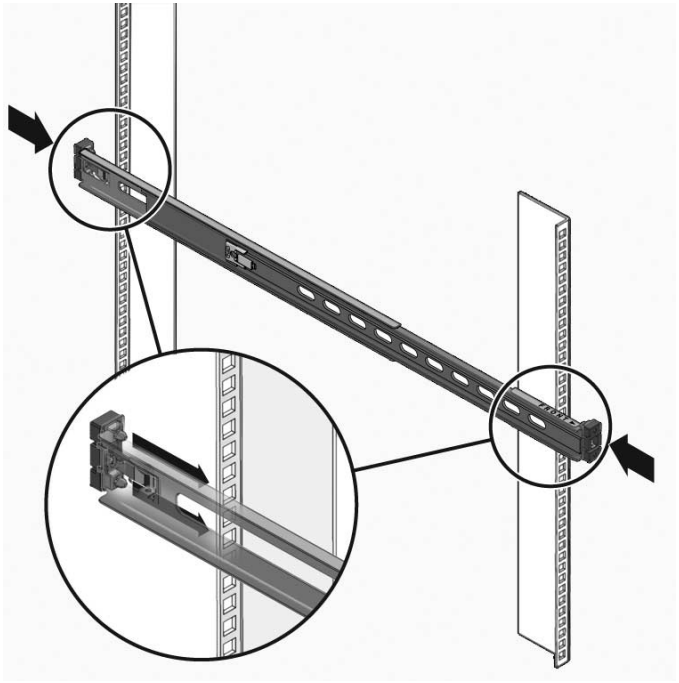
FIGURE: Express Rail Slide Rails Orientation for Installation



5. **Extend the slide rails (outer section) to fit the rack and attach the slide rails to the rack.**

   You hear an audible click when the rails securely attach to the rack.

FIGURE: Attaching Express Slide Rails to the Rack



Caution – Deploy the antitilt feature on the rack before continuing the installation.

Related Information

- "To Insert and Lock the Server in the Rack" on page 81

▼ To Insert and Lock the Server in the Rack

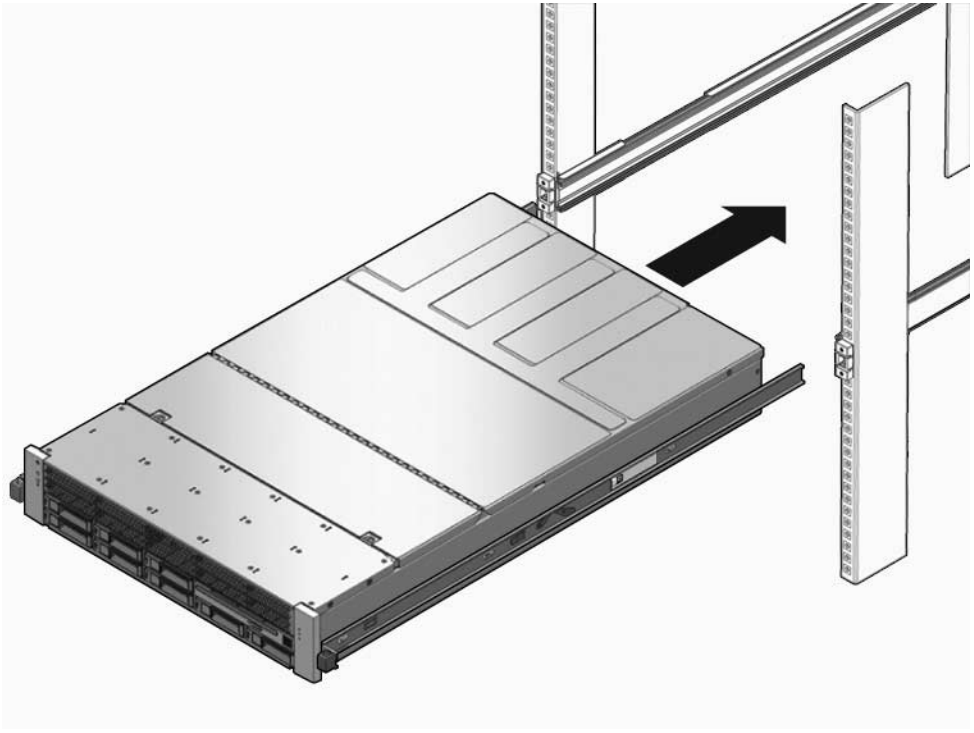
1. Deploy the antitilt feature, if the rack is so equipped.

Caution – The weight of the servers on extended slide rails can be enough to overturn an equipment rack.

Caution – The 2U server weighs approximately 55 lb (25 kg). Two people are required to lift and mount the server into a rack enclosure when using the procedures in this chapter.

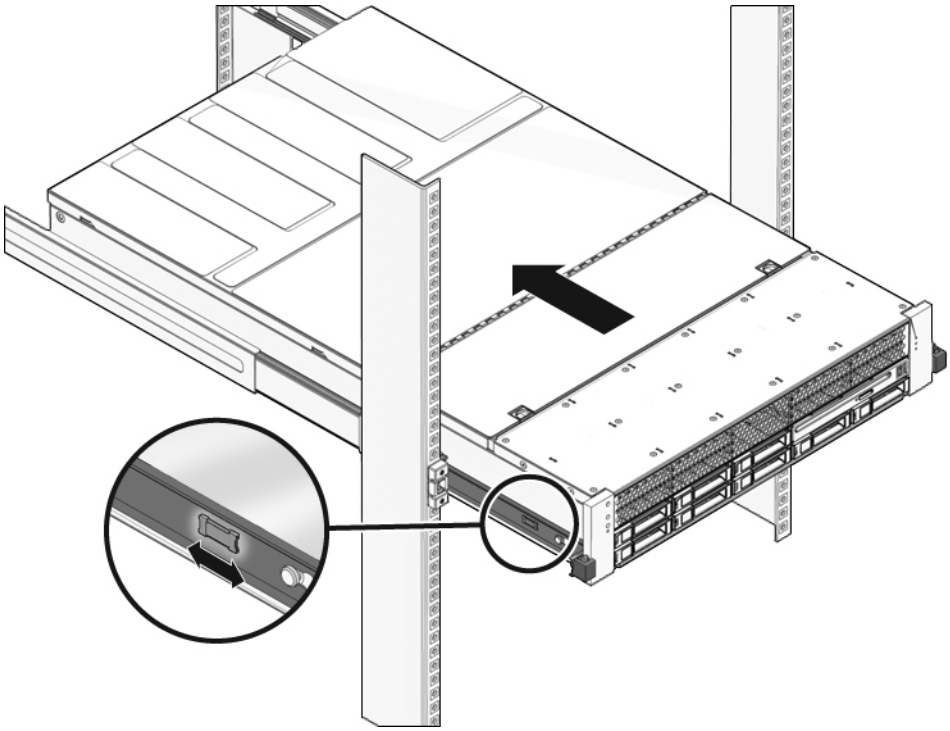
2. **Insert the ends of the mounting brackets into the sliding rails.**
3. **Slide the server approximately halfway into the chassis.**

FIGURE: Inserting Express Rail Mounting Brackets Into the Slide Rails



4. **Slide the green release tab.**
5. **Push the server all the way into the rack until it locks into place.**

FIGURE: Sliding the Express Rail Release Tab and Securing the Server in the Rack



Caution – Before continuing, verify that the server is securely mounted in the rack and that the slide rails are locked in the mounting brackets.

Related Information

- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Getting Started Guide*
- *Sun SPARC Enterprise T5120 and T5220 Servers Getting Started Guide (DC)*

Installing the Cable Management Arm

The rackmounting kit for each server comes with the same cable management arm (CMA) assembly. The CMA installation procedures are the same for both servers.

See "Installing the Cable Management Arm for Both Servers" on page 27.

Related Information

- "Installing the Cable Management Arm for Both Servers" on page 27
- "Connecting the Server Cables for Both Servers" on page 34
- "Managing Cables With the CMA" on page 39

Dismounting the Server

Caution – To prevent damage to your server, do not move the rack while the server is mounted.

To install or replace internal parts in the server, you must first remove the server from the rack. For the removal procedure, refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

Related Information

- Sun SPARC Enterprise T5120 and T5220 Servers Documentation
- *Sun SPARC Enterprise T5120 and T5220 Servers Service Manual*

Assembling and Installing DC Power Cables for the Sun SPARC Enterprise T5120 Server

This section provides the following DC input power information for the Sun SPARC Enterprise T5120 server:

- "Requirements for Servers With DC Input Power" on page 85
- "Assembling and Installing the DC Input Power Cables" on page 87
- "Connecting the DC Input Power Cords to the Server" on page 96

The procedures in this section are only for the Sun SPARC Enterprise T5120 server. Do not use this section for assembling the DC power cables for the Sun SPARC Enterprise T5220 server.

Related Information

- "Assembling and Installing the DC Input Power Cables" on page 101

Requirements for Servers With DC Input Power

The following restrictions apply to the Sun SPARC Enterprise T5120 server with DC input power:

- The DC version of the server must be installed in a restricted-access location. According to the intent of the National Electrical Code, a restricted-access location is an area intended for qualified or trained personnel only and has access controlled by a locking mechanism, such as a key lock or an access card system.
- The server must not be directly connected to centralized DC mains.

Related Information

- "DC Supply and Ground Conductor Requirements" on page 86

DC Supply and Ground Conductor Requirements

The server must meet the following:

- Suitable conductor material: use copper conductors only
- Power supply connections through the input connector: 12 AWG (between the server and the source). There are three conductors:
  - -48V or -60V (negative terminal)
  - Chassis ground connection
  - -48V or -60V Return (positive terminal)
- System ground conductor: 12 AWG (to be connected to the chassis)
- Cable insulation rating: Minimum of 75°C (167°F), low smoke fume (LSF), flame retardant
- Provide a Wago Type 721-103/037-000 mating connector for proper connection to the DC connectors supplied with the server (Wago Type 721).
- Branch circuit cable insulation color: Per applicable National Electrical Codes
- Grounding cable insulation color: Green/Yellow
- DC power source must meet TNV-2 requirements as defined by UL 60950-1 and IEC 60950-1

Note – Depending on the DC power source, the -48V or -60V (negative terminal) might be marked with a minus (-) symbol, and the -48V or -60V Return (positive terminal) might be marked with a positive (+) symbol.

When attaching DC cables, keep the following requirement in mind:

Caution – You must restrict the connection of the server to the DC power source to minimize the possibility that transient energy will appear on the main input to the equipment. The DC battery power source must be in the same premises as the server. The server cannot be in one building with the power source in another building.

Related Information

- "Overcurrent Protection Requirements" on page 87

Overcurrent Protection Requirements

- Overcurrent protection devices must be provided as part of each equipment rack.
- Circuit breakers must be located between the DC power source and the server. Use one 20 A fast-trip double-pole DC-rated circuit breaker for each power supply unit.

Note – Overcurrent protection devices must meet applicable national and local electrical safety codes and be approved for the intended application.

Related Information

- "Assembling and Installing the DC Input Power Cables" on page 87

Assembling and Installing the DC Input Power Cables

The following procedure describes how to assemble the DC input power cables for the Sun SPARC Enterprise T5120 server.

Assemble one cable for each DC power supply in your server.

Before you begin the installation procedure, verify that the required conditions described in the following table have been satisfied.

TABLE: Prerequisites Not Covered by the DC Cable Installation Procedure

Prerequisite Condition	Responsible Party
Install a DC power source that meets the server's input power specifications.	Customer
Secure DC power cables that meet the server's power cabling specifications.	Customer
Attach the DC input plug to the DC input power cables. The input plug is provided in the server's shipping kit.	Customer

Related Information

- "To Assemble the DC Input Power Cables" on page 88

▼ To Assemble the DC Input Power Cables

1. **Turn off power from the DC power source using the circuit breakers.**

Caution – Do not proceed with these instructions until you have turned off the power from the DC power source through the circuit breakers.

2. **Identify the parts that you will use to assemble the DC input power cables**

   For each cable, you need the three parts shown in the figure below. These items are provided in the shipping kit that came with your server.

FIGURE: DC Connection Parts

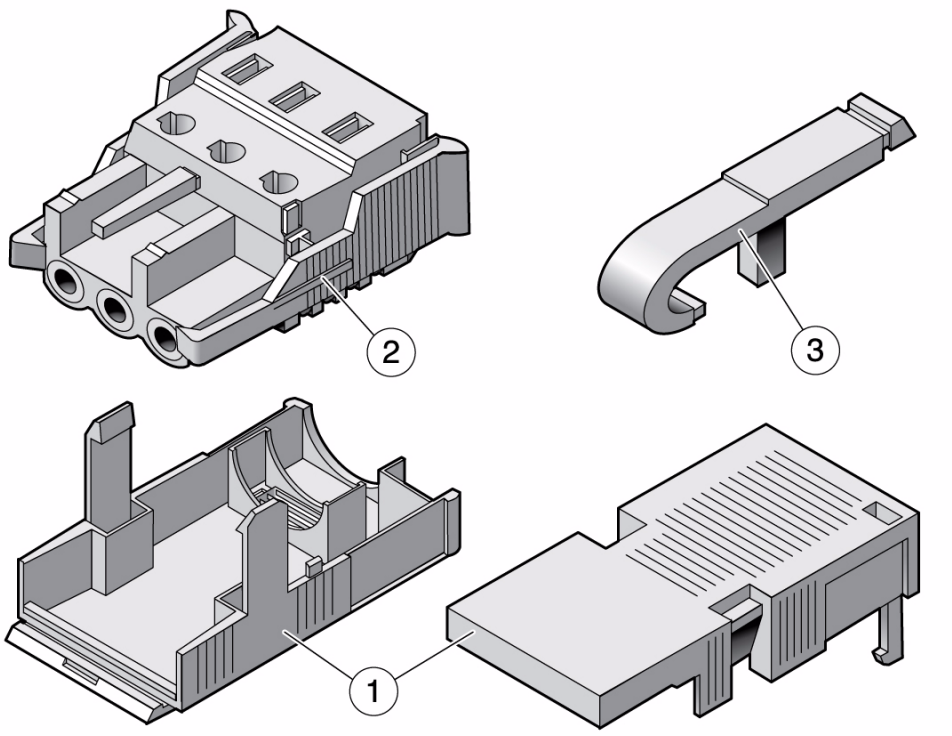


Figure Legend

1	Strain relief housing
2	DC input plug
3	Cage clamp operating lever

3. **Locate the three wires coming from the DC power source that will be used in the connection to your unit:**
   - -48V or -60V (negative terminal)
   - Chassis ground
   - -48V or -60V Return (positive terminal)

Note – Depending on the DC power source, the -48V or -60V (negative terminal) might be marked with a minus (-) symbol, and the -48V or -60V Return (positive terminal) might be marked with a positive (+) symbol.

4. **Strip 5/16 inches (8 mm) of insulation from each of the wires coming from the DC power source.**

   Do not strip more than 5/16 inches (8 mm) from each wire. Doing so leaves uninsulated wire exposed from the DC connector after the assembly is complete.

FIGURE: Stripping the Insulation From the Wire

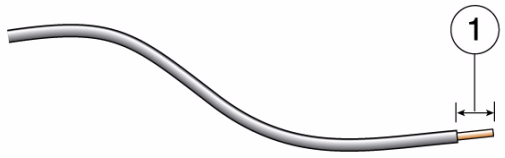


Figure Legend

1	Cable stripped to 5/16 in., or 8mm

5. **Open the cage clamp for this section of the DC input plug by taking one of the following actions:**

   - Insert the tip of the cage clamp operating lever into the rectangular hole directly above the hole in the DC input plug where you want to insert the first wire. Press down on the cage clamp operating lever.
   - Insert a small slotted screwdriver into the rectangular hole directly above the hole in the DC input plug where you want to insert the first wire, and push in to open the cage clamp.

FIGURE: Opening the DC Input Plug Cage Clamp Using the Cage Clamp Operating Lever

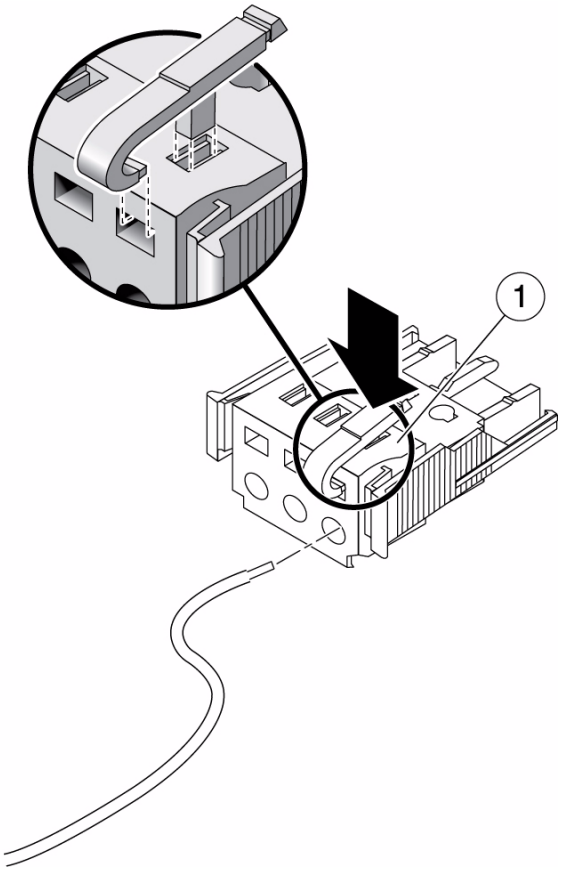


Figure Legend

1	Top of input plug

FIGURE: Opening the Cage Clamp Using a Screwdriver

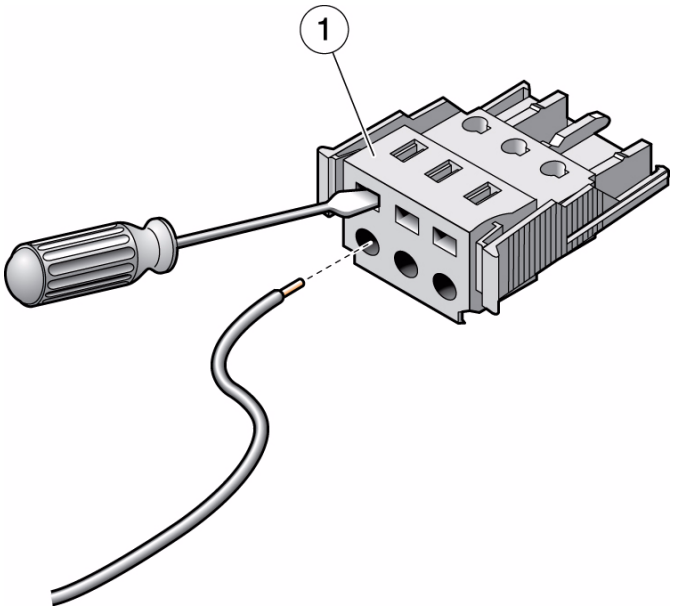


Figure Legend

1	Top of input plug

6. Feed the exposed section of the appropriate wire into the round hole in the DC input plug.

FIGURE: Connector Wiring Assignments

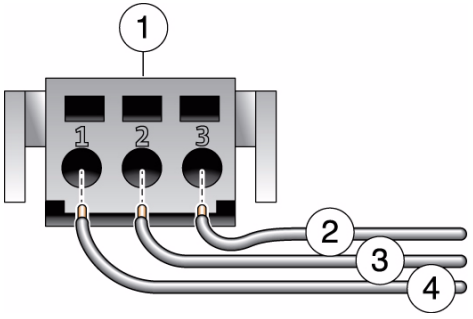


Figure Legend

1	Top of connector	**3**	From chassis ground (green/yellow)
2	From -48V or -60V return	**4**	From -48V or -60V

Note – If you need to remove a wire from the DC input plug, insert the cage clamp operating lever or a small screwdriver as described in Step 5, and pull the wire from the DC input plug.

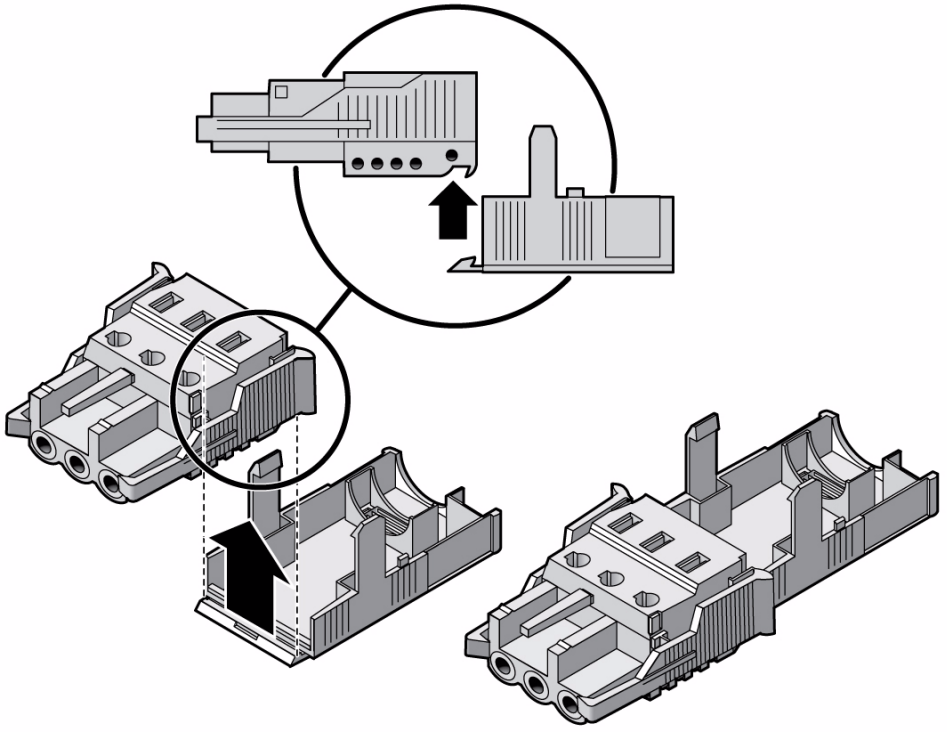
7. **Release the lever or remove the tool to secure the wire into the connector.**
8. **Repeat Step 5 and Step 7 for the other two wires to complete the assembly of the DC input power cable.**
9. **Repeat this procedure to create as many DC input power cables as you need for your unit.**

▼ To Install the Strain Relief Housings

1. **Insert the bottom portion of the strain relief housing into the notch on the DC input plug until it snaps into place.**

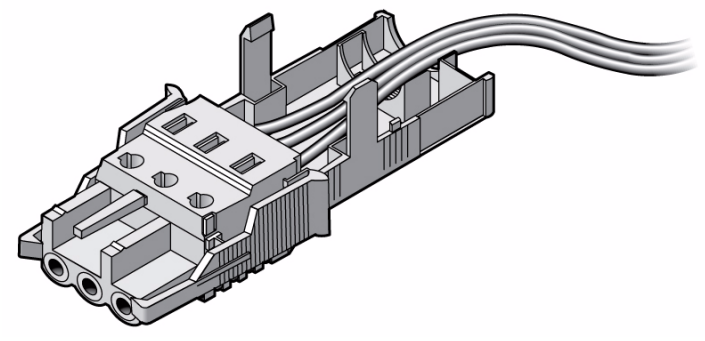
   Ensure that the strain relief housing snaps into place on the DC input plug. You cannot complete the assembly correctly if the strain relief housing is not snapped into place.

FIGURE: Inserting the Bottom Portion of the Strain Relief Housing



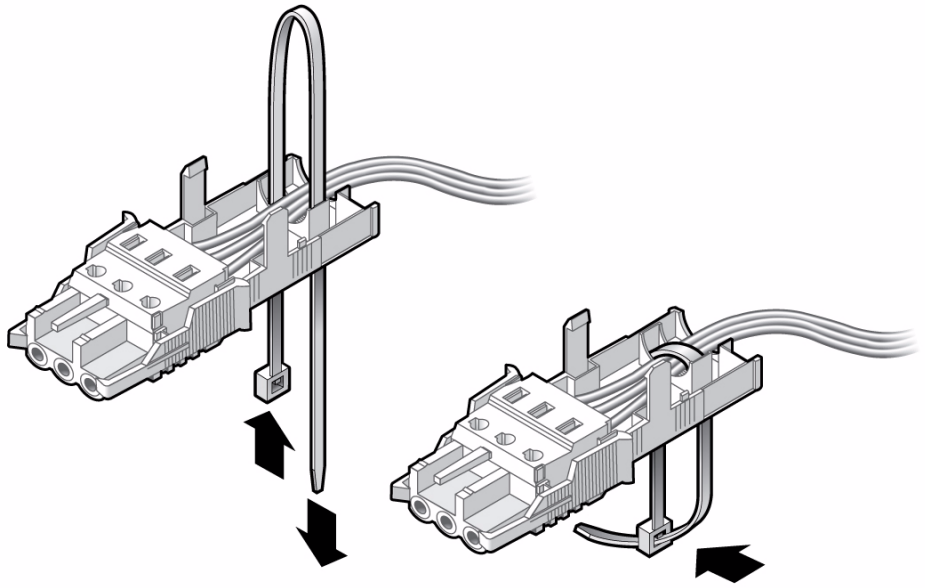
2. **Route the three wires coming from the DC power source through the opening at the end of the bottom portion of the strain relief housing.**

FIGURE: Routing the Wires out of the Bottom Portion of the Strain Relief Housing



3. **Insert a tie wrap into the bottom portion of the strain relief housing.**

FIGURE: Securing the Wires to the Strain Relief Housing

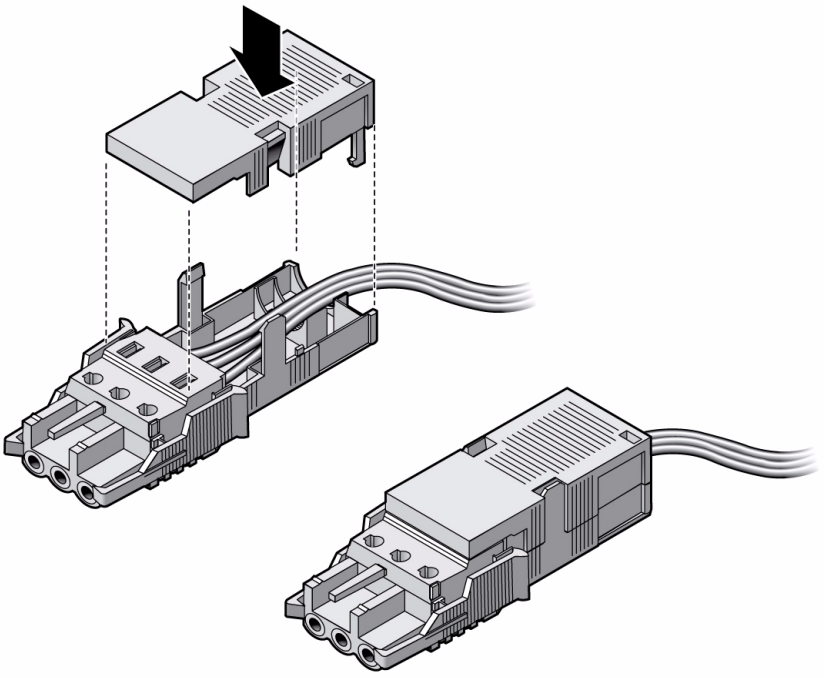


4. **Loop the tie wrap over the wires and back out of the strain relief housing, and tightening the tie wrap to secure the wires to the strain relief housing.**

5. **Lower the top portion of the strain relief housing so that the three prongs on the top portion insert into the openings in the DC input plug.**

   Push the top and bottom portions of the strain relief housing together until they snap into place.

FIGURE: Assembling the Strain Relief Housing



Related Information

- "Connecting the DC Input Power Cords to the Server" on page 96

▼ Connecting the DC Input Power Cords to the Server

1. Ensure that the circuit breaker to your power source is turned off.

Caution – Do not proceed with these instructions until you have turned off the power from the DC power source through the circuit breakers.

2. Route the power cables in the rack and secure the cables with nylon tie wraps.

3. **Connect the chassis ground wire to the facility earth ground and ensure that this connection has proper bonding.**
4. **Connect the -48v or -60V return to the -48 v or -60V wires to the circuit breaker.**
5. **Connect the power wiring to the server by plugging each power cable into the server power supply units.**
6. **When you are ready to power up the server, close the circuit breaker and following booting procedure described in,** "Powering On the System for the First Time" on page 43**.**

Related Information

- "Assembling and Installing the DC Input Power Cables" on page 87

Assembling and Installing DC Power Cables for the Sun SPARC Enterprise T5220 Server

This section provides the following DC input power information for the Sun SPARC Enterprise T5220 server:

- "Requirements for Servers With DC Input Power" on page 99
- "Assembling and Installing the DC Input Power Cables" on page 101

The procedures in this section are only for the Sun SPARC Enterprise T5220 server.

Do not use this section for assembling the DC power cables for the Sun SPARC Enterprise T5120 server. Instead, see, "Assembling and Installing the DC Input Power Cables" on page 87.

Requirements for Servers With DC Input Power

The following restrictions apply to the Sun SPARC Enterprise T5220 server with DC input power:

- The DC version of the server must be installed in a restricted-access location. According to the intent of the National Electrical Code, a restricted-access location is an area intended for qualified or trained personnel only and has access controlled by a locking mechanism, such as a key lock or an access card system.
- The server must not be directly connected to centralized DC mains.

DC Supply and Ground Conductor Requirements

The server ground conductor must meet the following requirements:

- Suitable conductor material: use copper conductors only

- Power supply connections through the input connector: 8 AWG (between the server and the source). There are three conductors:
  - -48V or -60V (negative terminal)
  - Chassis ground connection
  - -48V or -60V Return (positive terminal)
- System ground conductor: 8 AWG (to be connected to the chassis)
- Cable insulation rating: Minimum of 75°C (167°F), low smoke fume (LSF), flame retardant
- Provide the mating connector, Wago Part Number 51204745, for proper connection to the DC connectors supplied with the server.

  This connector requires a 4mm flat-blade screwdriver to insert wires into the connector body.
- Branch circuit cable insulation color: Per applicable National Electrical Codes
- Grounding cable insulation color: Green/Yellow
- DC power source must meet TNV-2 requirements as defined by UL 60950-1 and IEC 60950-1

Note – Depending on the DC power source, the -48V or -60V (negative terminal) might be marked with a minus (-) symbol, and the -48V or -60V Return (positive terminal) might be marked with a positive (+) symbol.

When attaching DC cables, keep the following caution in mind:

Caution – You must restrict the connection of the server to the DC power source to minimize the possibility that transient energy will appear on the main input to the equipment. The DC battery power source must be in the same premises as the server. The server cannot be in one building with the power source in another building.

Overcurrent Protection Requirements

- Overcurrent protection devices must be provided as part of each equipment rack.
- Circuit breakers must be located between the DC power source and the server. Use one 40 A fast-trip double-pole DC-rated circuit breaker for each power supply unit.

Note – Overcurrent protection devices must meet applicable national and local electrical safety codes and be approved for the intended application.

Assembling and Installing the DC Input Power Cables

The following procedure describes how to assemble the DC input power cable for the Sun SPARC Enterprise T5220 server.

Assemble one cable for each DC power supply in your server.

Before you begin the installation procedure, verify that the required conditions described in the following table have been satisfied.

TABLE: Prerequisites Not Covered by the DC Cable Installation Procedure

Prerequisite Condition	Responsible Party
Install a DC power source that meets the server's input power specifications.	Customer
Secure DC power cables that meet the server's power cabling specifications.	Customer
Attach the DC input plug to the DC input power cables. The input plug is provided in the server's shipping kit.	Customer

▼ To Assemble the DC Input Power Cables

1. Turn off power from the DC power source using the circuit breakers.

Caution – Do not proceed with these instructions until you have turned off the power from the DC power source through the circuit breakers.

2. Identify the parts that you will use to assemble the DC input power cables.

For each cable, you need the three parts shown in the figure below. These items are provided in the shipping kit that came with your server (DC models only).

FIGURE: DC Connection Parts

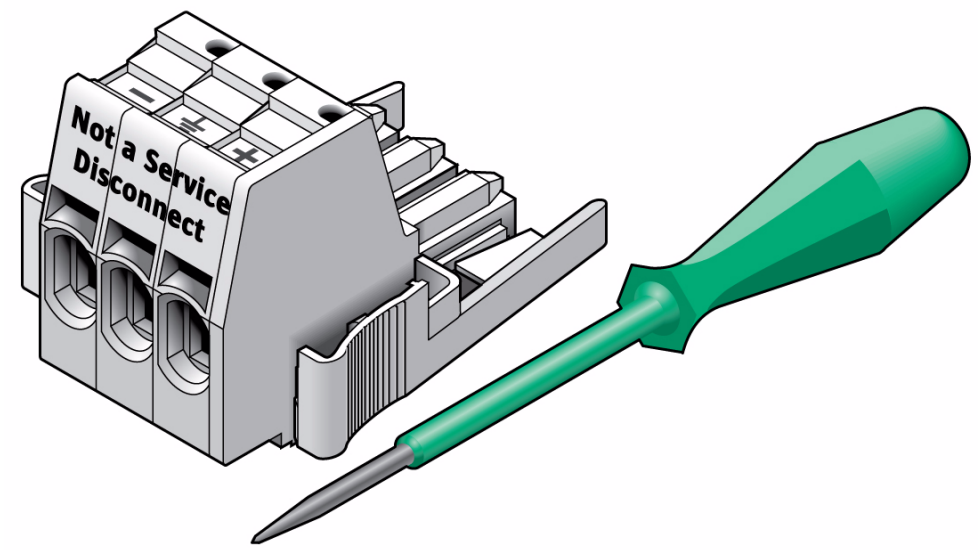


Figure Legend

1	DC input plug
2	Cage clamp operating tool or small screwdriver

3. **Locate the three wires coming from your DC power source that will be used in the connection to your unit:**
   - -48V or -60V (negative terminal)
   - Chassis ground
   - -48V or -60V Return (positive terminal)

Note – Depending on the DC power source, the -48V or -60V (negative terminal) might be marked with a minus (-) symbol, and the -48V or -60V Return (positive terminal) might be marked with a positive (+) symbol.

4. **Strip 1/2 inches (13 mm) of insulation from each of the wires coming from the DC power source.**

   Do not strip more than 1/2 inches (13 mm) from each wire. Doing so leaves uninsulated wire exposed from the DC connector after the assembly is complete.

FIGURE: Stripping the Insulation From the Wire

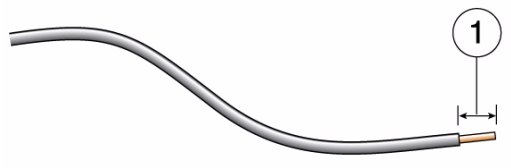
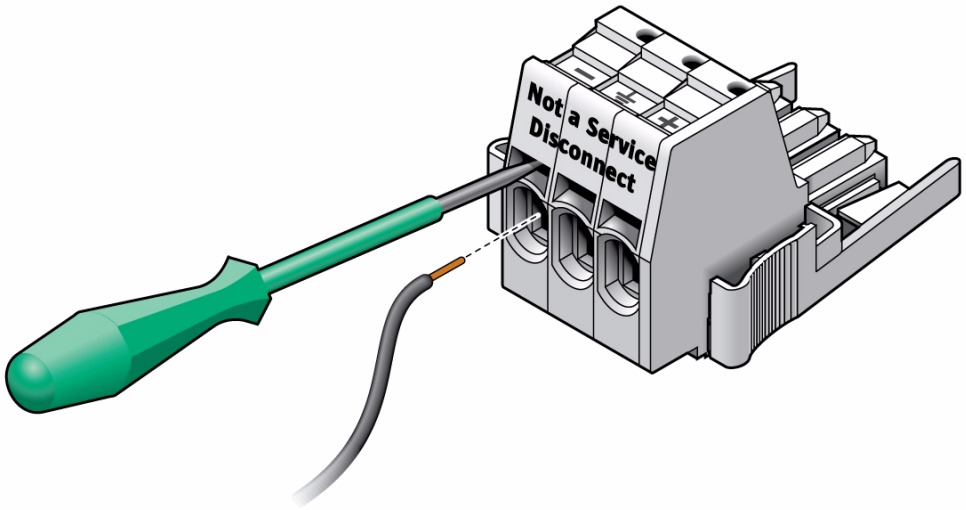


Figure Legend

1	Strip the insulation 1/2 in., or 13 mm.

5. Open the cage clamp by inserting the cage clamp tool (or small screwdriver) into the rectangular hole directly above the hole in the DC input plug where you want to insert the first wire, and push in to open the cage clamp.

FIGURE: Opening the Cage Clamp Using the Cage Clamp Tool



6. Feed the exposed section of the appropriate wire into the round plug hole in the DC input plug.

FIGURE: Connector Wiring Assignments

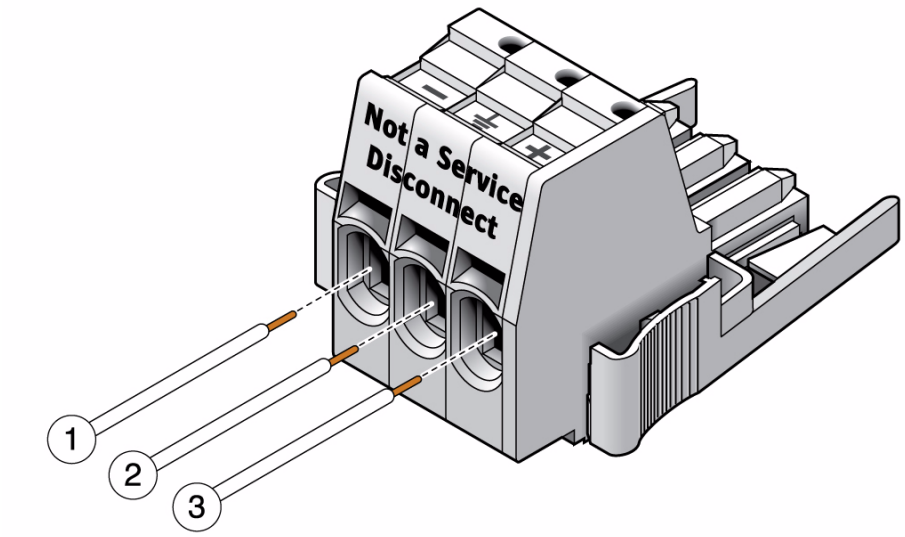


Figure Legend

1	From -48V or -60V
2	From Chassis ground (green/yellow)
3	From -48V or -60V Return

Note – If you need to remove a wire from the DC input plug, insert the cage clamp operating tool or a small screwdriver into the slot directly above the wire and push in. Pull the wire from the DC input plug.

7. **Remove the cage clamp tool to secure the wire.**
8. **Repeat** Step 5 **and** Step 6 **for the other two wires to complete the assembly of the DC input power cable.**
9. **Repeat this procedure to create as many DC input power cables as you need for your unit.**

▼ To Connect the DC Input Power Cords

1. **Ensure that the circuit breaker to your power source is turned off.**

Caution – Do not proceed with these instructions until you have turned off the power from the DC power source through the circuit breakers.

2. **Route the power cables in the rack and secure the cables with nylon tie wraps.**
3. **Connect the chassis ground wire to the facility earth ground and ensure that this connection has proper bonding.**
4. **Connect the -48V or -60V return to the -48V or -60V wires to the circuit breaker.**
5. **Connect the power wiring to the server by plugging each power cable into the server power supply units.**
6. **When you are ready to power up the server, close the circuit breaker and following booting procedure described in** "Powering On the System for the First Time" on page 43**.**

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